Executive Summary

The purpose of this report is to provide insight into how organizations considered "sustainable" currently publicly disclose information on occupational health and safety (OHS). The report presents an analysis of the extent to which:

- Organizations report on key OHS-related performance indicators
- Information reported helps provide an understanding of actual OHS performance
- Information reported lends itself to comparability across organizations.

A compelling case can be made that voluntary "sustainability" or "social responsibility" corporate reporting schemes have failed to yield the kind of comprehensive and meaningful data needed by key stakeholders.

The study involved the analysis of corporate social responsibility reports, sustainability reports, annual reports, registration documents, and/or other information publicly available on corporate websites between June and December 2016 for each organization on the Corporate Knights' *Global 100 Most Sustainable Corporations in the World 2016* list ("Global 100"). Data on OHS-related performance indicators were collected, analyzed and organized; focusing first on the Global Reporting Initiative (GRI) sustainability reporting framework (version G4 Labor Aspects 5-8) and second on the metrics provided by the Center for Safety and Health Sustainability ("CSHS"). Included in each section are aggregate summaries on how well the group responds to each indicator. The report concludes with recommendations for improving and standardizing OHS performance indicators.

This work represents CSHS's second analysis of the Corporate Knights *Global 100 Most Sustainable Corporations in the World.* The first report, "*Current Practices in Occupational Health & Safety Sustainability Reporting,*" was published in 2013.[1] This body of work will inform the leading sustainability reporting frameworks and standards development organizations (GRI, UN Global Compact, International Integrated Reporting Council and Sustainability Accounting Standards Board) on the viability of their OHS performance indicators or other guidance they provide to reporters in this context.[2]

Is OHS a Material Issue?

Materiality has become an important issue in corporate sustainability reporting. Materiality has its roots in corporate financial reporting and has moved to the forefront of sustainability-related discussions. It is an accounting principle that requires financial information relevant to the decision-making needs of end users be disclosed. Driven by the recognition that material sustainability data and metrics are important to financial investment decisions, the financial community has begun to develop guidelines and standards on how material sustainability information should best be reported.

74 of the Global 100 reported on the results of a materiality analysis, usually in the form of a materiality matrix or chart. The "material" issues identified were typically prioritized based on an evaluation of the issue's importance to key external stakeholders or the organizations' business operations or strategies. OHS was specifically identified as a material issue by 45 of the 74 organizations reporting materiality information.

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[1] February 2013. Center for Safety and Health Sustainability, accessed June 8, 2017, http://www.centershs.org/assets/docs/CSHS_SustainReport_2013_FinalZ.pdf

[2] Twenty eight organizations appear on both the Corporate Knights *Global 100 Most Sustainable Corporations in the World* reports that CSHS analyzed.

KEY FINDINGS

- Reporting on GRI G4:
  - G4 LA5 (Corresponds to GRI G3.1 LA6) - While the number of reporters complying with this indicator has increased since CSHS's analysis in 2013 (from 5 reporters to 10), the numbers are still very low.
    - 10% reported on percentage of total workforce represented in formal joint management-worker health and safety committees.
    - Only 3 reported on the level at which each joint management-worker health and safety committee typically operates within the organization.
  - G4 LA6 (Corresponds to GRI G3.1 LA7) – The number of reporters utilizing an injury rate or a lost time rate decreased slightly since CSHS's analysis in 2013 (from 75 reporters to 72).
    - 49 reported on worker/employee injury rates.
    - 23 reported on a lost day rate for workers/employees but not injury rates (overall, 66 organizations reported on lost day/lost time/severity rates).
    - Occupational disease rate reporting increased (from 6 reporters to 15) but remains at a low level of 15% of the reporters.
    - Reporting on the gender specific information requested is extremely low (4% or less).
  - G4 LA7 (Corresponds to GRI G3.1 LA8) – While the number of reporters complying with this indicator has increased since CSHS's analysis in 2013 (from 3 reporters to 8), the numbers are still very low.
    - 7 indicated that they had no workers performing activities that expose them to specific diseases.
    - 1 provided the number of employees involved in high-incident or high-risk activities.
  - G4 LA8 (Corresponds to GRI G3.1 LA9) – No change in performance since the CSHS 2013 analysis.
    - None of the organizations followed the GRI instruction to "report the extent, as a percentage, to which various health and safety topics are covered by these agreements."
    - 2 list the number of agreements in place which deal totally or partially with health and safety.
- The number of reporters providing information on fatalities increased (from 38 reporters to 50).
  - 12 reported more than one work-related death.
  - 4 reported 10 or more fatalities.
  - 2 reported more than 20 work-related fatalities (20 and 27).
  - 1 reported a total of 63 deaths over a 3-year period.
  - No organization specifically mentioned fatalities related to occupational diseases.
- The lack of standardized terms, definitions, and formulas used to report OHS performance continues to be an issue, making it difficult to compare performance across organizations.
  - 14 different definitions were used for workers.
  - 12 different definitions of absentee or explanations of the scope of absenteeism-related information were used.
  - 11 different formulas were used to calculate the absentee rate.
- There were low levels of reporting on the three leading indicators recommended by CSHS.

RECOMMENDATIONS

- Identify one or more indicators that relate to OHS management systems.
  - CSHS recommends two indicators around occupational health and safety management systems:
    - Percentage of owned or leased work locations that have implemented an occupational health and safety management system that meets recognized standards.
    - Percentage of owned or leased work locations that have had their occupational health and safety management systems audited by an independent third party.

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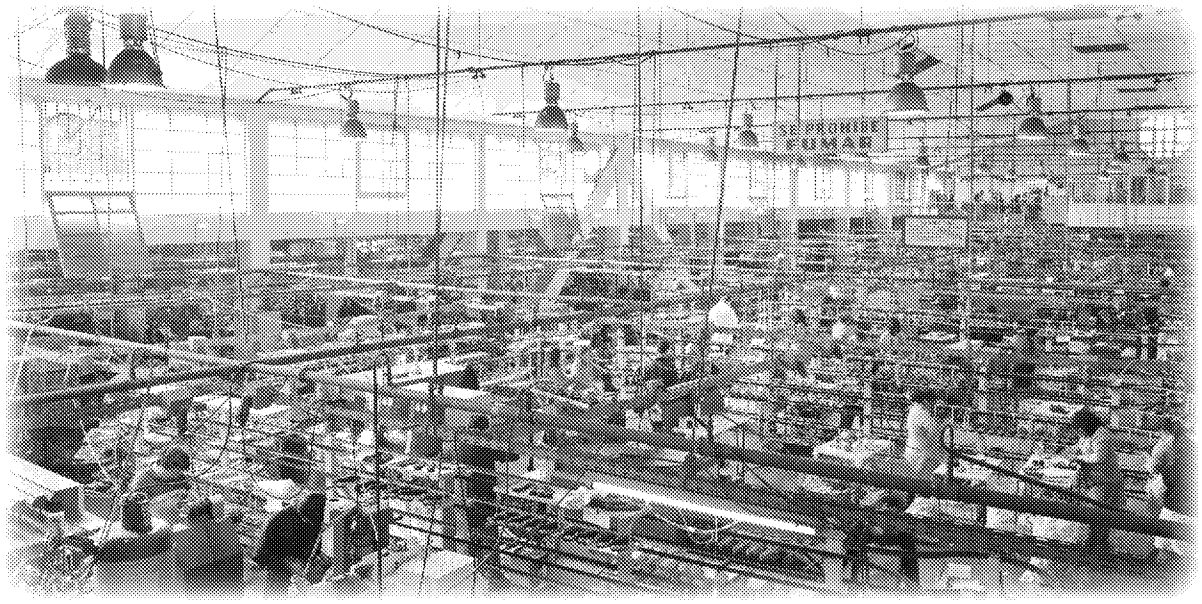
[3]International Labour Organisation press statement 2011 www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_154749/lang--en/index.htm. Last accessed June 8 2017.

These leading indicators are designed to measure whether systems are in place to effectively manage worker health and safety. The International Labour Organization (ILO) has stated that: "Implementation of OSH management systems is critical in helping to reduce occupational accidents, diseases and deaths."[3] The ILO's OHSMS (ILO-OSH 2001) and OHSAS 18001 (an ISO 14001-based approach), have been widely implemented throughout the world. A new ISO global standard on OHSMS, ISO 45001, is scheduled for completion this year.

- Identify one or more indicators that measures OHS performance in the supply chain.
  - CSHS also recommends that organizations report the percentage of direct or first-tier suppliers' facilities in developing countries that were audited for compliance with health and safety standards. This leading indicator is based on recognition that workers for suppliers in developing countries are especially vulnerable to OHS risks. The International Labour Organization (ILO) has reported that the work-related mortality rate in developing countries is five to seven times higher than in industrialized nations. ILO research also found that while accidents and illnesses are decreasing in the developed world, both are increasing in the developing world. Organizations that source products from developing countries are well positioned to provide oversight and support for their suppliers to ensure the safety, health, and well-being of supplier workers. Our proposed indicators would encourage reporters to audit their suppliers, thereby helping to promote proactive safety measures and saving lives in the long run.
  - Some current supporters provide injury, illness, and fatality rates for their supply chain vendors.
    - One of the organizations on the Global 100 reported no employee fatalities for the previous year but did report 27 deaths in the "supply chain and others" category (17 contractors and 10 members of the public) during that same period.
- Identify specific formulas to be used in reporting data. While in some instances it is not difficult to convert data outputs from one formula to compare to the data generated using another formula, it is sometimes a complex process, especially for stakeholders who are less familiar with the OHS field.
- Simplify and clarify the definitions. GRI has 9 defined terms to identify the parties relevant to injury and illness reporting. This adds an unnecessary level of complexity to the reporting process. Fewer and more easily understood terms should be the goal. In addition, the guidance to reporters should require reporters to define terms used in their reports.
- Ranking organizations should use performance criteria that only awards sustainability rankings to organisations that report on their work-related fatalities and show an improving trend.



Introduction

On April 5, 2017, the Global Reporting Initiative (GRI), a network-based organization that developed the world's most widely used sustainability reporting framework, announced the formation of a Project Working Group to revise GRI 403: Occupational Health and Safety, the GRI OHS-related performance indicators which have not been substantively changed since 2006. Two members of CSHS leadership have been selected to serve on the working group. CSHS, which has been collaborating with GRI on improving OHS performance indicators since 2011, welcomed these developments.[4]

In 2011, CSHS and several of its partners from the international OHS community completed GRI online surveys, submitted comments outside GRI's survey platform, and participated in GRI workshops to provide input during the development of GRI's most recent iteration of its framework, G4. In response to the interest expressed in OHS during the consultation process, GRI announced plans to form an OHS working group in May 2012. At that time, GRI noted that several issues had come to light through the G4 development process to be addressed by the OHS working group, particularly the need to improve clarity, give more consideration to contractors/subcontractors, and standardize data.[5] Ultimately, no OHS working group was formed by GRI in 2012.

In 2013 CSHS published a report entitled *Current Practices in Occupational Health & Safety Sustainability Reporting*, which provided insight into reporting practices on OHS indicators by organizations listed on the Corporate Knights *Global 100 Most Sustainable Corporations in the World*. It specifically sought to identify gaps in overall OHS reporting and determine the practicality and utility of the GRI 3.1 OHS-related indicators, as well as five indicators proposed by CSHS. Among these "most sustainable" organizations, the 2013 analysis showed very low conformance in reporting on the GRI OHS indicators and high variability in the terms and definitions used in reporting. This was the antithesis of the intent of GRI, effectively making it impractical to compare performance across organizations. Although this work was meant to inform the GRI G4 process, the new iteration of the framework was launched in 2013 with no substantive changes to the OHS-related indicators.

In 2014 and 2015 CSHS undertook a consultative process with the members of the CSHS home organizations, the Institution of Occupational Safety and Health, the American Society of Safety Engineers, the American Industrial Hygiene Association, and the Canadian Society of Safety Engineering to vet the five OHS-related indicators proposed by CSHS. This process culminated with the 2016 publication of the *CSHS Best Practice Guide for Occupational Health and Safety in Sustainability Reports*, a cornerstone in the CSHS efforts to standardize OHS reporting.

The purpose of this report is to determine the current state of OHS sustainability reporting and whether there has been any improvement in reporting practices since CSHS last analyzed the Corporate Knights' *Global 100 Most Sustainable Corporations in the World* in 2013. Since that time, the corporate reporting landscape has dramatically changed. Investors and other key stakeholders are demanding more and better information on corporate performance. Influenced by the work of the International Integrated Reporting Council (IIRC), a global coalition of regulators, investors, companies, standard setters, the accounting profession and NGOs, there has been a heightened interest in measuring the value of human capital, which has implications for OHS-related reporting. In addition, new OHS-related guidance has been developed by the Sustainability Accounting Standards Board (SASB) with the aim of better aligning sustainability reporting with financial reporting.[6]

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[4] In May of 2013 GRI launched the fourth generation (G4) of its sustainability reporting guidelines, replacing version G 3.1. The G4 Guidelines have now been superseded by the GRI Sustainability Reporting Standards (GRI Standards). The GRI Standards will be required for all reports or other materials published on or after 1 July 2018 – the G4 Guidelines remain available until this date. In addition, the GRI Standards Glossary 2016 is designed to be used together with the GRI Standards. It includes terms and definitions that apply in the context of using the GRI Standards for sustainability reporting. For purposes of this report, we use the G4 indicators and definitions that were in place at the time the Global 100 reports were published. Note: there have been some changes in the definitions in moving from G4 to the GRI Standards but the changes do not alter the recommendations made in this report.

[5] "G4 Development: Occupational Health and Safety Working Group Terms of Reference, 9 May 2012" Global Reporting Initiative, accessed June 8, 2017, https://www.globalreporting.org/SiteCollectionDocuments/GRI-Occupational-Health-and-Safety-Working-Group-Terms-of-Reference.pdf

[6] OHS indicators have been developed within industries where OHS is deemed likely to be a material issue. See SASB Standards Download site, accessed June 8, 2017, https://www.sasb.org/standards/download/

The data collected and analyzed in this report, as well as the recommendations set forth below, will serve to inform leading sustainability reporting frameworks, standards development organizations and the GRI OHS working group. CSHS views improving the GRI OHS-related indicators as a critical step in improving OHS performance and, ultimately, preventing worker injuries, illnesses, and fatalities.

METHODOLOGY

The Corporate Knights' Global 100 Most Sustainable Corporations in the World 2016 served as the source for the sample group of 100 organizations analyzed in this report. The Corporate Knights' list was originally selected for the CSHS analysis in 2013 "Due to its size, institutional influence, breadth of industries represented, and timeliness."[7]

Corporate Knights analyzes data from all publicly-traded companies with a market capitalization of at least US $2 billion. For 2016, they analyzed data from 4,600 companies against their global industry peers on a list of twelve quantitative key performance indicators, relating to such topics as energy and water use, executive compensation, leadership diversity, and safety performance.

Corporate Knights stated that their reason for including an indicator on safety performance is that "companies with an unusually high number of fatalities or an abnormally high lost time injury rate compared to sector norms could be suffering from inadequate management systems, or generally poor management focus." The scoring methodology used by Corporate Knights for safety performance is as follows:

> Each company's Safety Performance is comprised of the Lost Time Injury Score (50% weight) and the Fatality Score (50% weight). The Lost Time Injury Score is determined by calculating the company's lost time injury rate (defined as the number of lost time incidents per 200,000 employee hours) and percent-ranking it against that of all same-industry group peers within the CK coverage universe. The Fatality Score is determined by calculating the company's fatality rate (defined as the number of fatalities divided by the total number of fill-time equivalent employees) and percent-ranking it against that of all same-industry group peers within the CK coverage universe.[8]

For purposes of this report, CSHS researchers reviewed the most recent corporate social responsibility reports, sustainability reports, annual reports, registration documents, and/or other information publicly available on corporate websites between June and December 2016 for each organization on the Corporate Knights list. Data on worker safety-related topics were collected from each of the sources, including any information reported related to:

- OHS in general.
- GRI G4 Indicators LA5-8, whether directly reporting on these indicators or not—and in the cases where organizations are responding directly to GRI indicators, the variation in interpretation of the compilation instructions.
- The Center's proposed OHS metrics.

All analyses are drawn from the most recently reported year for each organization.

This report will provide information on the data accumulated for the Corporate Knights *Global 100* corporations, organized by GRI OHS related Labor Aspects (LA) indicator, including an aggregate summary of how well the group responds to each indicator. It will then provide an overview of the proposed CSHS indicators and the degree to which the *Corporate Knights Global 100* corporations provide information on these indicators. The report concludes with recommendations for optimizing the GRI OHS indicators for the purposes of encouraging standardized, comprehensive, meaningful reporting on occupational health and safety performance.

[7] CSHS, *Current Practices*, page 7.

[8] "The 2017 Future 40 Ranking: Overview of Methodology," Corporate Knights, accessed June 8, 2017, http://www.corporateknights.com/wp-content/uploads/2016/10/2017Future40methodology.pdf

GRI G4 Occupational Health & Safety Indicators

G4-LA5

Percentage of total workforce represented in formal joint management–worker health and safety committees that help monitor and advise on occupational health and safety programs

a. Report the level at which each formal joint management-worker health and safety committee typically operates within the organization.

b. Report the percentage of the total workforce represented in formal joint management-worker health and safety committees.

GRI'S INSTRUCTIONS FOR COMPILING DATA

Identify formal health and safety committees that help monitor, collect feedback and advise on occupational safety programs. These committees may exist at the facility level or at multi-facility, region, group or organization levels.

Calculate the total number of workers represented by these committees, as a percentage of total workforce numbers.

CSHS FINDINGS

Summary

- Out of the 100 reporters, 10 (5) reported on percentage of total workforce represented in formal joint management-worker health and safety committees, consistent with G4 LA5.
- Only 3 (2) reported on the level at which each joint management-worker, health and safety committee typically operates within the organization, consistent with G4 LA5.

Findings

- 29 (32) organizations reported on some activity related to health and safety committees. Of those:
  - 10 (5) listed the percentage of total workforce represented in formal joint management-worker health and safety committees;
  - 10 (7) referenced the use of health and safety committees, but provided no data and few details on activities;
  - 6 (2) reported that they form joint committees as required by local laws, with 2 stating that the information resulting from consolidating information on committees beyond the local level is not relevant to their decision-making process;
  - 2 (N/A) reported on the number of health and safety committees;
  - 1 (N/A) reported on the percentage of sites with health and safety committees.
- 3 (2) organizations reported on the level of operation as required by the GRI compilation instructions. These organizations reported on levels in general terms:
  - 2 (1) stated that they maintain committees at the site level: manufacturing, research and development, or office;
  - 1 (N/A) indicated that the committees operated at the group level;
  - 1 (N/A) organization only included information from locations that have more than 100 employees.
- 1 (N/A) organization indicated that their reported percentage included information on temporary workers, interns, and thesis and doctoral candidates.

Red denotes corresponding numbers from the 2013 *Current Practices in Occupational Health & Safety Sustainability Reporting.*

Center for Safety & Health Sustainability

G4-LA6

Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender

a. Report types of injury, injury rate (IR), occupational diseases rate (ODR), lost day rate (LDR), absentee rate (AR) and work-related fatalities, for the total workforce (that is, total employees plus supervised workers), by:
- **Region**
- **Gender**

b. Report types of injury, injury rate (IR), occupational diseases rate (ODR), lost day rate (LDR), absentee rate (AR) and work-related fatalities for independent contractors working on-site to whom the organization is liable for the general safety of the working environment, by:
- **Region**
- **Gender**

c. Report the system of rules applied in recording and reporting accident statistics.

GRI'S INSTRUCTIONS FOR COMPILING DATA

Since some organizations include minor (first-aid level) injuries in their data, indicate whether such injuries are included or excluded.

Report this information separately for the total workforce (that is, total employees plus supervised workers) and independent contractors working on-site to whom the organization is liable for the general safety of the working environment, by:
- Region
- Gender

The injury rate includes fatalities.

CSHS FINDINGS

Summary

- 87 (77) organizations provided some information on the rate or number of accidents, incidents, or injuries.
  - 49 (48) reported on worker/employee injury rates.
  - 23 (29) reported on a lost day rate for workers/employees but not injury rates (overall, 66 organizations reported on lost day/lost time/severity rates).
  - 10 (9) reported on the number of accidents, injuries, lost time, or major incidents.
  - 5 (N/A) reported on a reduction in lost day/lost time/severity rates but did not report what the rates were.
- 20 (18) organizations provided information on contractors, subcontractors, or other third party personnel.
  - 12 (N/A) relate to on-site contractors.
  - 8 (N/A) do not define the term "contractor".
  - 12 (N/A) report contractor information separate from worker/employee information.
  - 8 (N/A) include contractor information with their worker/employee report.
  - 1 (N/A) reported an improvement in contractor injury and lost day rate without providing the rates.
  - 1 (N/A) provided the number of major incidents involving contractors.

INJURY RATE

Summary

- 49 (48) organizations reported on worker/ employee injury rate.
- 5 (6) different formulas were used to calculate injury rate overall.
- 12 (12) different terms were used for "rates of injury."
- 15 (15) different methods were used to define a report-worthy injury or incident.

Calculations

- 25 (34) calculated the rate using injuries per million hours worked.
- 10 (17) used the formula total # of injuries/total hours worked x 200,000.
- 8 (N/A) used injuries per 100 full-time employees.
- 1 (N/A) used injuries per square foot
- 1 (5) used injuries per 100,000 hours worked
- 1 (3) used injuries per 1000 workers
- 3 (N/A) did not describe how they calculated the rate

Terms

Terms Used to Describe "Rates of Injury"

- Industrial accident frequency rate
- Frequency rate
- Incident rate
- Total recordable injury frequency rate
- Occupational recordable rate
- Reportable incident rate
- Reportable accident rate
- Frequency rate of medical treatment injuries
- Recordable cases
- Accident rate
- Recordable incidents

Scope of coverage

Quoted from reports analyzed:

- Includes all employees (both full-time and part-time) involved in the daily operations and project management of its development sites.
- Third party personnel are those individuals employed by a third party that work regularly on the premises and receive day-to-day work assignments from company associates.
- Operational accidents
- Employees, on-site contractors and on-site members of public.
- For non-mobile personnel, accidents occurring during the home-workplace commute are not included in this indicator.
- Employees and temporary employees.
- Employees and resident third parties.
- Excluding commuting accidents.
- Includes main contractors on-site.
- Includes on-site subcontractors.
- Employees and employees of external companies who work at on site and are directly contracted
- Employees (on permanent, fixed term or apprenticeship contracts).
- Accidents/injuries during working hours or when travelling to or from work.
- Definition of an 'employee': all temporary staff and contractors who work under our direct supervision.
- We incorporate the applicable national definitions for categorizing incidents as being work related. Depending on national regulations, foreign or temporary workers may also count as employees.
- Contractors who bill by time, especially those who work on large project sites.
- Domestic employees only (permanent, casual and contractors paid directly by the Group).

Gender/Region

- 9 (6) organizations reported the information by regions.
- 1 (2) reported information by gender.

Range of Years Reported

- The number of years covered by each organization's report ranged from 1 to 11 (1 to 18), with the majority reporting information from a period ranging from 1 year to 5 years (1 to 5).

GRI: OCCUPATIONAL DISEASES RATE

Identify the occupational disease rate (ODR) experienced during the reporting period.

Report this information separately for the total workforce (that is, total employees plus supervised workers) and independent contractors working on-site to whom the organization is liable for the general safety of the working environment, by:

- Region
- Gender

CSHS FINDINGS

Summary

- 25 (12) organizations provided some data on their occupational disease loss experience.
  - 15 (6) reported on employee/worker occupational disease rates.
  - 8 (6) reported the number of employee/worker occupational disease cases (5 reported occupational disease rate and number of cases).
  - 1 (N/A) reported days lost to diseases.
  - 1 (N/A) reported on days lost due to stress.
- 3 (3) formulas were used in reporting disease rate.
- Terms used to describe the scope of the reported diseases/illnesses/pathologies included "recognized" illnesses, "reported" diseases, and "declared" diseases, and "suspected" occupational diseases although these terms were not defined.

Calculations

- 5 (2) reported the information using the employee illnesses per million hours worked formula.
- 1 (0) reported calculated occupational disease rate using the formula of total # of occupational diseases cases/ Total hours worked x 200,000).
- 1 (1) used cases per 1000 employees.
- 4 (N/A) did not indicate what formula was used in calculating the rate.

Gender/Region

- No organization reported on occupational diseases by gender (1)

- 3 (0) provide breakdowns by geographic location or region.

Range of Years Reported

- The number of years covered by each organization's report ranged from 1 to 5 (1 to 5).

GRI: LOST DAY RATE

Identify the lost day rate (LDR) experienced during the reporting period.

In calculating 'lost days' indicate:

- Whether 'days' means 'calendar days' or 'scheduled work days'
- At what point the 'lost days' count begins (for example, the day after the accident or 3 days after the accident)

Report this information separately for the total workforce (that is, total employees plus supervised workers) and independent contractors working on-site to whom the organization is liable for the general safety of the working environment, by:

- Region
- Gender

CSHS FINDINGS

Summary

- 66 (29) reported a lost day related rate for workers/employees.
- 7 (4) different formulas were used to calculate lost day rate.
- 8 (3) different definitions of "lost day" were used.

Calculations

- 22 (5) calculated the rate using lost days per million hours worked.
- 15 (4) followed the formula of total # of lost days/ Total hours worked x 200,000/# of lost working days due to accidents].
- 11 (N/A) used lost days per 100 full time employees.
- 7 (1) used lost days per 1,000 hours.
- 2 (N/A) used lost days per 1,000 workers.
- 2 (1) used lost days per 100,000 hours worked
- 1 (N/A) reported an improvement in lost day rate without providing the rates.
- 6 (N/A) did not define how they calculated the rate.

Definitions

From reports:

- A lost time Injury is where an employee is kept from attending a complete normal work day following the day in which a work-related incident occurred, or a cumulative condition is reported.
- Lost time injuries or illnesses is (based on workers' compensation claims accepted) resulting in an employee being unable to work for a full scheduled day (or shift) other than the day (or shift) on which the injury occurred where work was a significant contributing factor.
- A lost time accident is defined as any work-related incident resulting in injury or illness where the individual is unable to work or where a job restriction is required. Our LTA numbers also include any work-related fatalities.
- The assessment of lost time excludes the day the incident occurred, is based on calendar days, and is made without regard to whether or not the person was scheduled to work.
- Based on work-related incidents that resulted in more than three days of medical leave or more than 24 hours of hospitalization.
- Lost time injury frequency is one that results in lost time of one day or more within a 12-month period.
- Lost time injuries are defined as workplace injuries which result in an employee being absent from work for over seven days as per the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995.
- Fatalities are automatically counted as 6,000 lost days.

Gender/Region

- 1 (1) corporation reported on gender.
- 1 (19) reported by geographic area.

Range of Years Reported

- The number of years covered by each corporation's report ranged from 1 to 6 (1 to 6), with the majority reporting information from 2 to 5 years. (1 to 10)

GRI: ABSENTEEISM RATE

Identify the absentee rate (AR) experienced during the reporting period.

Report this information separately for the total workforce (that is, total employees plus supervised workers) and independent contractors working on-site to whom the organization is liable for the general safety of the working environment, by:

- Region
- Gender

CSHS FINDINGS

Summary

- 44 (27) reported an absentee rate or total number of days absent.

- 11 (8) different formulas were used to calculate absentee rate.
- 12 (6) organizations provided definitions of "absentee" or explanations on the scope of the absenteeism-related information provided.

Calculations

- Total # of missed (absentee) days over the period/Total # of workforce days worked for same period x 200,000]
- Total number of sickness absence hours as a percentage of planned/scheduled working hours
- Total number of sickness days as a percentage of calendar days lost
- Rate of employee absence per million hours
- Average number of sick days per full time equivalent
- Hours of absenteeism x 100 / theoretical hours (average workforce x 1,682 hours)
- Number of hours of absence due to illness / theoretical number of regular working hours x 100
- Total days' absenteeism / average staff No. x 11 (months) x 22 (days)
- # of sick leave hours/# of hours worked
- Calculated taking into account the method used locally by each entity, weighted in relation to headcount
- % absence hours/theoretical working time

Definitions and Explanatory Comments

- GRI defines "absentee" as "An employee absent from work because of incapacity of any kind, not just as the result of work-related injury or disease. Permitted leave absences such as holidays, study, maternity/paternity, and compassionate leave are excluded."
- 12 (6) organizations provided definitions of "absentee" or explanations on the scope of the absenteeism-related information provided:
  - Sick days due to occupational injuries, commuting injuries and occupational diseases
  - Illness, work-related accidents and occupational illness, excluding commuting and other authorized absences.
  - "In some countries, such as Japan, sick leave is regarded as annual leave quota and illness-related absenteeism is recorded as zero."
  - Absences due to illness, a doctor's appointment, or medical treatment of the company's own personnel
  - Includes absenteeism due to illness and every other kind of absence (maternity leave, paternity leave, unjustified absences, etc.).
  - Excludes days of temporary layoff, disciplinary suspension, strikes, maternity leave, absence for family events (legal or under agreements), statutory holidays or unpaid leave.
  - Excluding short-time work, layoffs, strikes and holidays (including maternity leave).
  - The length of absence beyond which employees are considered "inactive" instead of "absent" varies from one country to the next.
  - The scope of this indicator includes actively working permanent employees but excludes temporary staff, interns, apprentices, summer job staff and inactive employees.
  - Does not include absences authorized by the company: paid leave, holidays, unpaid leave, parental leave, sabbatical leave, business creation leave, leave for family-related responsibilities and unworked notice periods.
  - Absenteeism is defined as the total of working days not worked, excluding paid leave, training courses, trade union absences, exceptional and standard leave and additional days of leave. Contract suspensions are not counted. However, all cases of sick leave, including long-term disability leave, are included.
  - For the "Absenteeism" indicator in particular, French sites use the social assessment definition, which is different from the definition recommended by the Group's reporting procedures.

Gender/Region

- 4 (1) organizations reported on gender.
- 1 (N/A) reported by age of the employees
- 12 (5) reported by country or region

Range of Years Reported

- The number of years covered by each corporation's report ranged 1-3 years.

GRI: FATALITIES

Identify the absolute number of fatalities that occurred during the reporting period.

Report this information separately for the total workforce (that is, total employees plus supervised workers) and independent contractors working on-site to whom the organization is liable for the general safety of the working environment, by:

- Region
- Gender

GRI'S INSTRUCTIONS FOR COMPILING DATA

Fatality

The death of a worker occurring in the current reporting period, arising from an occupational in-

jury or disease sustained or contracted while in the organization's employ.

CSHS FINDINGS

Summary

- 50 (38) organizations reported on the number of worker/employee fatalities.
- 25 (23) reported on contractor fatalities.
- 23 (28) reported at least one work-related fatality. of those:
  - 12 (16) reported more than one work-related death.
  - 4 (5) reported 10 or more fatalities.
- 2 reported more than 20 work-related fatalities (20 and 27) (1 reported 49) and 1 reported a total of 63 deaths over a 3-year period (70 over a 3-year period).

Definitions

- Although the GRI definition of "fatality" includes disease-related deaths, no corporation specifically mentioned that category of fatalities.

Gender/Region

- 5 (1) reported by geographic area.
- 2 (2) reported by division or business line.
- 1 (3) reported fatalities by gender.

Range of Years Reported

- The number of years covered by each corporation's reporting on fatalities ranged from 1 to 10 years (1 to 8 years), with the majority reporting 1 year or 3 years (1 to 5 years).

G4-LA7

Workers with high incidence or high risk of diseases related to their occupation

a. Report whether there are workers who are involved in occupational activities who have a high incidence or high risk of specific diseases.

GRI's definition of serious disease includes stress: "Occupational or non-occupational related impairment of health with serious consequences for employees, their families, and communities. This may include but is not limited to HIV/AIDS, diabetes, RSI, malaria and stress."

CSHS FINDINGS

Summary

- 26 (N/A) organizations cited G4 LA7 in their reporting.
- 17 (3) reporters indicated that they had provided information that complied or partially complied with the requirements G4 LA7. These reporters only provided general information on disease prevention, medical services, training related to safety, worker health management or risk prevention without providing specific data on workers as required by G4 LA7.
- 7 (N/A) indicated that they had no workers performing activities that expose them to specific diseases.
- 1 (N/A) claimed medical privacy laws prevent disclosure of information on many serious diseases.
- 1 (N/A) provided the number of employees involved in high incident or high-risk activities.

G4-LA8

Health and safety topics covered in formal agreements with trade unions

a. Report whether formal agreements (either local or global) with trade unions cover health and safety.

b. If yes, report the extent, as a percentage, to which various health and safety topics are covered by these agreements.

GRI'S INSTRUCTIONS FOR COMPILING DATA

Identify whether the organization had local or global agreements in place with trade unions during the reporting period.

Identify the extent and coverage of health and safety topics within these agreements.

Agreements at the local level typically address topics that may include:

- Personal protective equipment
- Joint management-employee health and safety committees
- Participation of worker representatives in health

and safety inspections, audits, and accident investigations
- Training and education
- Complaints mechanism
- Right to refuse unsafe work
- Periodic inspections

Agreements at the global level typically address topics that may include:
- Compliance with the International Labour Organization (ILO)
- Arrangements or structures for resolving problems
- Commitments regarding target performance standards or level of practice to apply

Using this information, calculate the percentage difference between those agreements that contain this information versus those that do not.

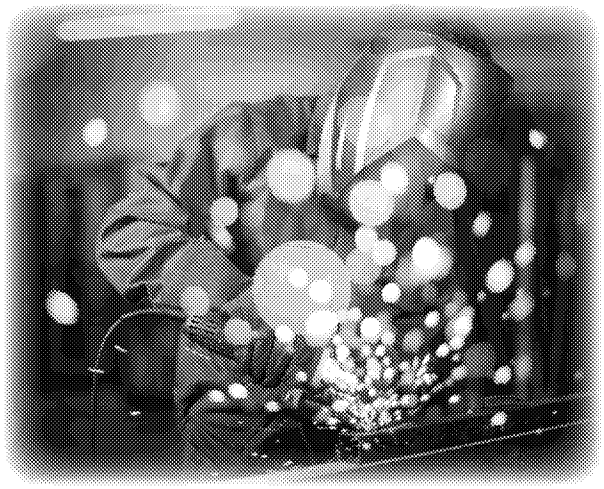
CSHS FINDINGS

Summary

- 32 (24) organizations referenced G4 LA8 in their reporting.
- None (0) followed the GRI instruction to report the extent, as a percentage, to which health and safety topics are covered by these agreements.
- 3 (11) reported that health and safety is covered as a topic in collective bargaining agreements.

Findings

- Of the 32 (24) organizations that reported on trade union activities:
  - None (0) of the organizations followed the GRI instruction to "report the extent, as a percentage, to which various health and safety topics are covered by these agreements."
  - 11 (8) reported on the percentage of workers/ employees covered by collective bargaining agreements without reference to health and safety topics.
  - 6 (0) state that they do not cover health and safety topics in formal agreements with trade unions.
  - 4 (N/A) cited LA 8 but provided no supporting information.
  - 3 (2) state that this aspect is managed locally.
  - 2 (5) listed the number of collective bargaining agreements.
  - 2 (N/A) state that this aspect is not applicable to them, 1 without explanation and the other because they are not a unionized company.
  - 2 (N/A) list the number of agreements in place which deal totally or partially with health and safety.
  - 1 (N/A) states that actual percentages are not tracked at the enterprise level.
  - 1 (N/A) states that no agreements dealing solely with occupational health and safety are in place but health and safety is included as a topic in broader agreements signed with trade unions.



Health and Safety Topics

- 1 (2) provided information on the types of health and safety topics that were covered in agreements with trade unions, stating that in local agreements: "These requirements may include personal protective and safety equipment, health and safety committees and their designated representatives, inspections, complaint processes and training."

Proposed CSHS Occupational Health & Safety Indicators for GRI Framework

Lost-time injury and illness frequency rate, lost-time injury and illness severity rate, and number of fatalities (all employees/workers – 5 year period).

Lost-time injury and illness frequency rate, lost-time injury and illness severity rate, and number of fatalities (all contractors – 5 year period).

CSHS FINDINGS

Definitions

Lost-time injury or illness

CSHS defines a lost-time injury or illness as "A nonfatal occupational injury or illness that causes a loss of time from work beyond the day or shift it occurred." In contrast, GRI allows the reporters to define lost days. GRI instructions for lost days is to indicate: "At what point the 'lost days' count begins (for example, the day after the accident or 3 days after the accident)." Since 8 different definitions of "lost day" were used by organizations in the *Global 100*, it is difficult or impossible to compare performance across organizations.

Worker and Contractors

Both CSHS and GRI guidance limit reporting on injuries and illnesses to those within the sphere of control of the corporation, either through direct supervision of the workers or as a result of their responsibility to provide a safe work environment. CSHS uses the terms "employee/worker" and "contractor" in defining the scope of reporting obligations for injuries and illnesses:

> "Employee/worker – A person who is subject to the control of the organization's management for the performance of work duties, including contract workers and temporary workers.
>
> Contractor – External person(s) providing services to an organization at a workplace in accordance with agreed specifications, terms and conditions."

GRI has a series of terms that are relevant to their guidance on the reporting of injuries and illnesses:

- Work-related fatality – Death of a worker occurring in the current reporting period arising from an occupational disease or injury sustained or contracted while performing work that is controlled by the organization or that is being performed in workplaces that the organization controls.
- Total workforce – The total number of persons working for the organization at the end of the reporting period (that is, the sum of all employees and supervised workers).
- Employee – An individual who is, according to national law or practices, recognized as an employee of the organization.
- Supervised worker – An individual who performs regular work on-site for, or on behalf of, the organization but is not recognized as an employee under national law or practice.
- Worker – Generic term for any person performing work, regardless of the contractual relationship.
  - Note 1: The term 'workers' includes, but is not limited to, employees.
  - Note 2: Further examples of workers include interns, apprentices, self-employed persons, and persons working for organizations other than the reporting organization, e.g., for suppliers.
- Supplier – Organization or person that provides a product or service used in the supply chain of the reporting organization. The supplier can have a direct or indirect relationship with the organization.
  - Examples of suppliers can include, but are not limited to:
    - Contractors – Persons or organizations working onsite or offsite on behalf of an organization with a relationship determined by contract. A contractor may hire their own staff or hire subcontractors or independent contractors.
    - Independent contractors – Persons or organizations working for an organization, a contractor, or a sub-contractor, with a relationship determined by contract. Independent contractors do not have an employment relationship with the organization.
    - Sub-contractors – Persons or organizations working onsite or offsite of an organization that have a direct contractual relationship with a contractor or sub-contractor but not

necessarily with the organization. A subcontractor may hire their own staff directly or hire independent contractors.

The lack of standardization in the use of terms remains a problem in the *Global 100*, making it difficult or impossible to compare performance among the organizations. *Global 100* corporations typically do not provide definitions of the terms used (8 of the 20 organizations reporting information on contractors did not define the term), sometimes use their own terms (third party personnel, temporary workers, resident third parties, main contractors, casual employees, etc.), and may have different definitions of terms based on local laws or practice (one corporation stated: "We incorporate the applicable national definitions for categorizing incidents as being work related. Depending on national regulations, foreign or temporary workers may also count as employees." Another reported on contractors who were "fixed or nested at a site for a minimum of a month.").

Scope of Coverage

One challenge reporters face is the lack of a common definition and varying legislation globally on how to classify and report injuries, illnesses, and fatalities in different areas, such as commuting to and from work. Two organizations from the Global 100 reported that accidents/injuries when traveling to and from work were excluded from their data and one corporation reported that such accidents/injuries were included in the reported information. Yet another corporation limited reporting to "operational accidents," without defining the term but may exclude commuting accidents/injuries.

Formulas

Similarly, CSHS recommends specific formulas for the reporting of lost-time injury and illness rate and lost-time injury and illness severity rate:

> Lost-time injury and illness rate – The number of lost-time injuries and illnesses per million hours worked, calculated using this formula: (Number of lost-time injuries and illnesses x 1,000,000)/Total hours worked in accounting period.
>
> Lost-time injury and illness severity rate – The number of days away from work due to workplace injury or illness per one million man hours worked, calculated using this equation: (# of work days lost x 1,000,000)/ Total hours worked

In a change in guidance from GRI G3.1 to GRI G4, GRI no longer recommends a specific formula for reporting injury, illness, and lost day rates. GRI now instructs reporters to "Report the system of rules applied in recording and reporting accident statistics." From the organizations on the *Global 100*:

- 66 (29) reported a lost day related rate for workers/employees.
- 22 (5) calculated the rate using lost days per million hours worked.
- 7 (4) different formulas were used to calculate lost day rate.

Range of Years Reported

The CSHS also requests that the reporters provide severity rates for a 5-year period, which standardizes the reporting range and allows for the gauging of an organization's OHS progress. As previously noted, the number of years reported on in the data collected on the Global 100 is highly variable, but it is common for organizations to provide data on multiple years' performance.

Percentage of owned or leased manufacturing, production, or warehousing facilities that have implemented an OHS management system that meets nationally or internationally-recognized standard or guideline.

CSHS FINDINGS

Summary

- 25 (34) organizations reported using an occupational health and safety management system (OHSMS).
- 18 (27) of the organizations reporting on this indicator referenced the standard they used in setting up their OHSMS. (FN: OHS standards – Standards required by contract with the supplier, pursuant to an agreed upon Supplier Code of Conduct, or by relevant local law or regulation.)
  - 16 (26) referred to OHSAS 18001.
- 21 (18) of the organizations provided some information on the scope of coverage for their OHSMS:
  - 8 (4) reported on the percentage of locations covered by the system.
  - 7 (0) reported on the number of locations with OHSMS.
  - 3 (4) reported on specific types of facilities or businesses (production, corporate management and operations, manufacturing, shipping, warehouse, industrial, engineering, office).
  - 1 (0) reported on the % of employees covered by the OHSMS.
  - 1 (0) reported on the % of production volume covered by the OHSMS.
  - 1 (1) reported on the number of countries with facilities covered by an OHSMS.

Percentage of owned or leased manufacturing, production, or warehousing facilities that have had their OHS management systems audited.

CSHS FINDINGS

Summary

- 18 (27) organizations reported that their OHSMS had been audited by an independent third party.
- 15 (26) organizations reported OHSAS 18001 certification.

Percentage of direct/first tier suppliers' facilities that were audited for compliance with OHS standards.

CSHS FINDINGS

Summary

- 34 (28) organizations reported that they had audited their suppliers in some fashion.
  - 21 (12) reported on the number of supplier audits.
  - 7 (6) reported on the number of suppliers audited.
  - 2 (1) reported on the number of facilities audited.
  - 2 (N/A) reported on the percentage of supplier spend audited.
  - 1 (1) reported on the percentage of new suppliers audited.
  - 1 (8) reported on the percentage of suppliers audited.
- There were 7 (11) descriptions of the "suppliers" that were audited:
  - Percentage of procurement spend
  - High risk suppliers
  - Significant suppliers
  - Elevated risk suppliers
  - Priority suppliers
  - Critical suppliers
  - "Tier 1" suppliers
- OHS was specifically mentioned as a subject matter of the audits by 14 (8) organizations.
- 8 (8) organizations reported some level of involvement by third party auditors.

Conclusion

A compelling case can be made that voluntary "sustainability" or "social responsibility" corporate reporting schemes have failed to yield the kind of comprehensive and meaningful data needed by key stakeholders. While the number of corporate reporting schemes has grown exponentially over the last decade (including recent trends in developing so-called "standards") there is still a lack of consensus on the metrics or indicators that should be reported, the data collection methodology and reporting formats to be used, and the definition of terms.

As demonstrated by the findings in this report, voluntary sustainability reporting on OHS lacks the degree of rigor necessary to allow key stakeholders to effectively evaluate corporate performance or compare performance across organizations. To address this concern, new levels of collaboration and compromise are needed among the leading sustainability reporting frameworks and standards development organizations (GRI, UNGC, IIRC and SASB). Standardized terms, definitions, and data collection methodology and reporting formats must be agreed upon and adopted by these groups. While the types of information needed by key stakeholders of these groups may vary (e.g. investors versus NGOs), the need for more disciplined reporting practices is universally applicable.

Other concerns stemming from the CSHS findings, such as the low levels of reporting on certain indicators, the lack of leading indicators, and the absence of an indicator relating to workers for suppliers in developing countries, highlight the need to re-evaluate the appropriateness of the OHS performance indicators currently recommended for reporters. The objective of such a review should be on identifying the indicators that measure activities that will ultimately have the most impact on performance.

Public reporting of performance-related data has been shown to be an impetus for organizations to improve or maintain performance. One study of the perceived impact of public reporting of hospital performance data found that it: "led to increased involvement of leadership in performance improvement; created a sense of accountability to both internal and external customers; contributed to a heightened awareness of performance measure data throughout the hospital; influenced or re-focused organizational priorities; raised concerns about data quality and led to questions about consumer understanding of performance reports." To achieve these objectives in OHS reporting, guidelines and reporting practices must standardized.[9]

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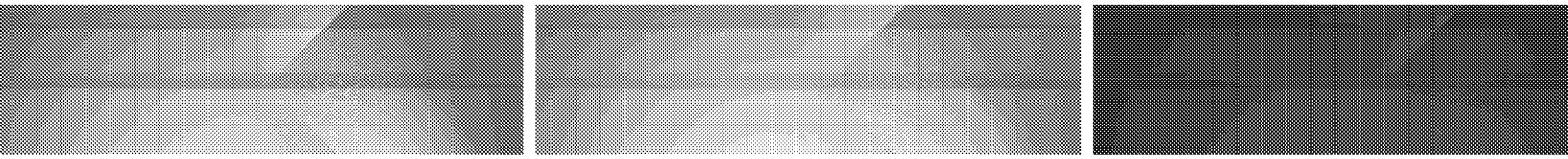
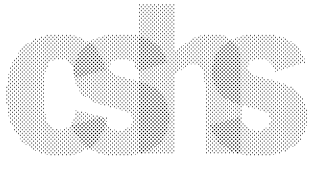
[9] JM Hafner, et al "The perceived impact of public reporting hospital performance data: interviews with hospital staff," *International Society for Quality in Health Care* 2011 Dec;23(6):697-704, accessed June 8 2017, doi:/10.1093/intqhc/mzr056.

RECOMMENDATIONS

- Identify one or more indicators relating to OHS management systems
  - CSHS recommends two indicators around occupational health and safety management systems:
    - Percentage of owned or leased work locations that have implemented an occupational health and safety management system that meets recognized standards
    - Percentage of owned or leased work locations that have had their occupational health and safety management systems audited by an independent third party

    These leading indicators are designed to measure whether systems are in place to effectively manage worker health and safety. The International Labour Organization (ILO) has stated that: "Implementation of OHS management systems is critical in helping to reduce occupational accidents, diseases and deaths." The ILO's OHSMS (ILO-OSH 2001) and OHSAS 18001 (an ISO 14001-based approach), have been widely implemented throughout the world. A new ISO global standard on OHSMS, ISO 45001, is scheduled for completion this year.
- Identify one or more indicators that measures OHS performance in the supply chain.
  - CSHS also recommends that organizations report the percentage of direct or first-tier suppliers' facilities in developing countries that were audited for compliance with health and safety standards. This leading indicator is based on recognition that workers for suppliers in developing countries are especially vulnerable to occupational health and safety risks. The International Labour Organization (ILO) has reported that the work-related mortality rate in developing countries is five to seven times higher than in industrialized nations. ILO research also found that while accidents and illnesses are decreasing in the developed world, both are increasing in the developing world. Organizations that source products from developing countries are well positioned to provide oversight and support for their suppliers to ensure the safety, health, and well-being of supplier workers. Our proposed indicators would encourage reporters to audit their suppliers, thereby helping to promote proactive safety measures and saving lives in the long run.
  - Some current supporters provide injury, illness, and fatality rates for their supply chain vendors
    - One of the organizations on the Global 100 reported no employee fatalities for the previous year but did report 27 deaths in the "supply chain and others" category (17 contractors and 10 members of the public) during that same period.
- Identify specific formulas to be used in reporting data. While in some instances it is not difficult to convert data outputs from one formula to compare to the data generated using another formula, it is sometimes a complex process, especially for stakeholders who are less familiar with the OHS field.
- Simplify and clarify the definitions. GRI has 9 defined terms to identify the parties relevant to injury and illness reporting. This adds an unnecessary level of complexity to the reporting process. Fewer and easier to understand terms should be the goal. In addition, the guidance to reporters should require reporters to define terms used in their reports.

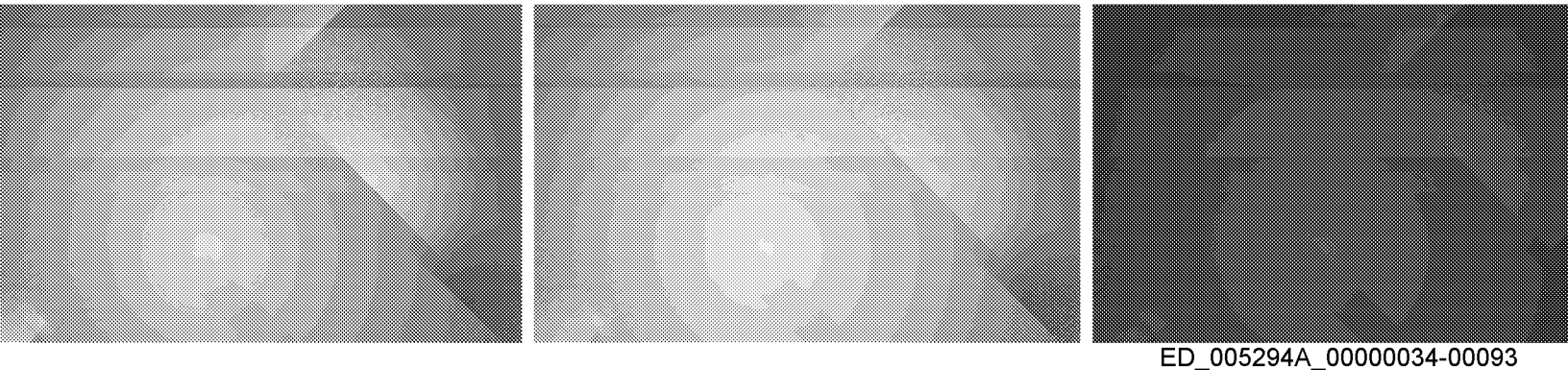


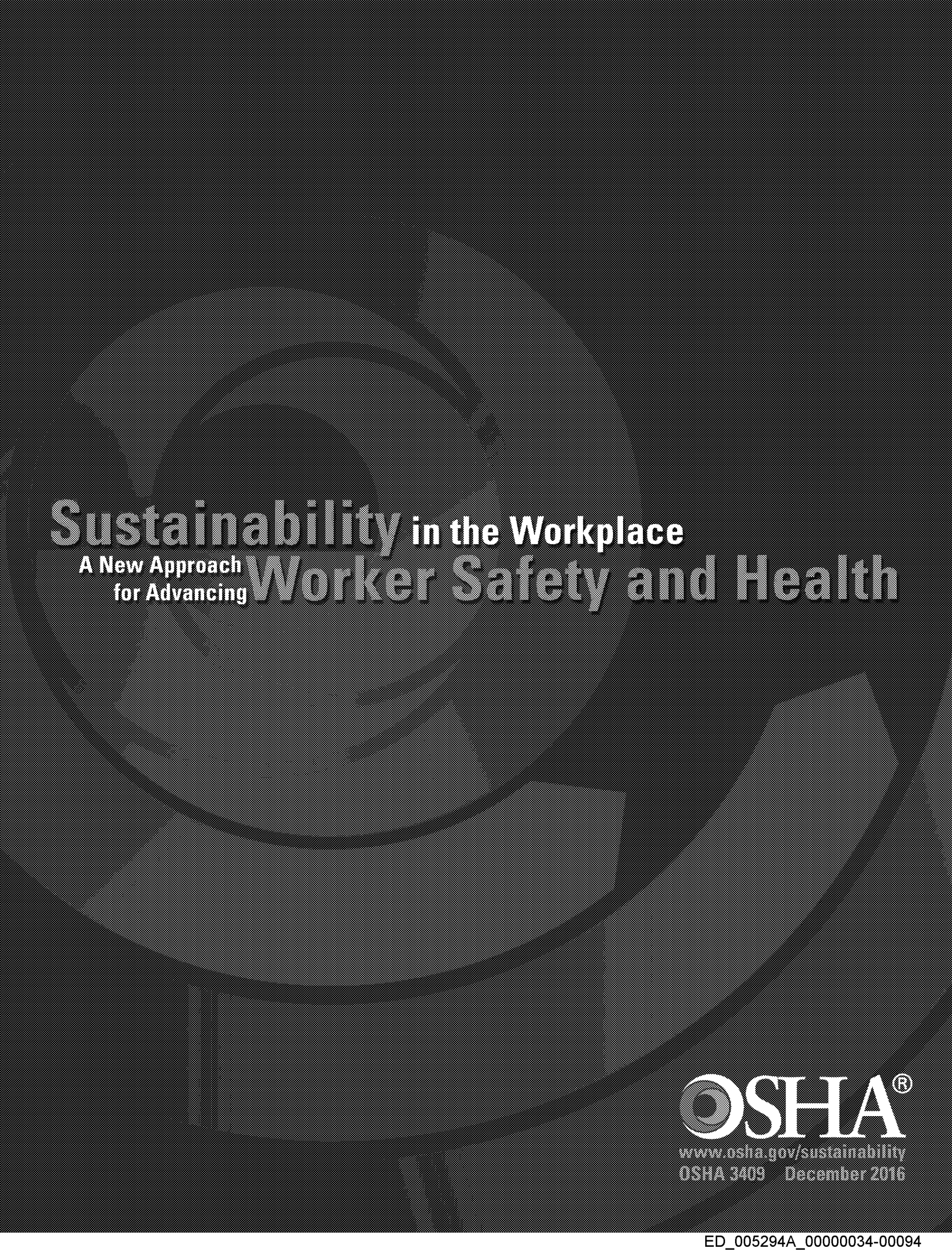


Center for
Safety & Health
Sustainability

The Center for Safety & Health Sustainability (CSHS), established in 2010, is a 501(c)(3) nonprofit organization committed to advancing the safety and health sustainability of the global workplace. CSHS engages safety and health partners around the world to work toward establishing minimum standards that help reduce workplace injuries and ill health. A collaborative effort founded by American Society of Safety Engineers, American Industrial Hygiene Association and Institution of Occupational Safety and Health, CSHS represents more than 100,000 workplace safety and health professionals in over 120 countries.

www.centershs.org





Sustainability in the Workplace

A New Approach for Advancing Worker Safety and Health

OSHA®

www.osha.gov/sustainability

OSHA 3409 December 2016

The organizations and resources included in this white paper are provided for reference only. The U.S. Department of Labor and the U.S. Occupational Safety and Health Administration take no responsibility for the views, content or accuracy of this information. Their inclusion, including the mention of trade names and commercial products, does not imply endorsement by the U.S. Government.

The U.S. Occupational Safety and Health Administration[1] (OSHA) recognizes that new strategies are needed to ensure that all workers return home safe, sound, and healthy from a day on the job. Workplace safety and health standards and their enforcement can have a huge impact on workers' lives—but the OSHA standard setting process is slow and even full compliance with standards will not prevent all work injuries and illnesses. There is much untapped potential to leverage other movements that are big, proactive, diverse in audience and stakeholders, future-thinking, and innovative to advance worker safety and health. Sustainability is one such movement that provides the potential to go beyond the Agency's traditional role and become a transformative force.

Rooted in the integration of environmental, social, and economic considerations, the sustainability movement has steadily gained power and traction. Individual organizations (companies, local and state governments, etc.) have been using sustainability as a platform for decision-making and transparency efforts. OSHA is not looking to redefine or reinvent sustainability; occupational safety and health (OSH) is already a component of existing conceptual models. However, in practice, the sustainability movement has focused more on environmental concerns, leaving key social and workplace considerations, such as OSH, behind.

Employers are only truly sustainable when they ensure the safety, health, and welfare of their workers.

The sustainability movement is going to continue to advance whether or not OSHA and the OSH community choose to actively engage. Where OSH is not part of the discussion, individuals, companies, and organizations that present themselves, their activities, or their products as sustainable may not be doing what is best for their workers. A building, no matter how energy efficient or healthy for occupants, is not sustainable if a construction worker is killed while building it. Furniture, no matter how responsibly the wood is harvested, is not sustainable if a woodworker loses a limb during manufacturing. The poultry supply chain, no matter how well free-range chickens are treated, cannot be sustainable when workers endure crippling musculoskeletal disorders while processing those chickens. Employers are only truly sustainable when they ensure the safety, health, and welfare of their workers.

OSHA has undertaken this project as a way to assess the current sustainability landscape, understand how OSH is integrated (or not) into sustainability efforts, and identify opportunities to leverage the sustainability movement to promote worker safety and health. This white paper was developed as a result of more than 80 conversations and the review of many articles, publications, reports, and frameworks. It lays out OSHA's understanding of sustainability, key areas where stakeholders are currently engaging, recognized opportunities and challenges, and potential actions that could advance OSH within sustainability discussions.

These ideas are just the beginning of the Agency's sustainability journey and future engagements with the sustainability community. OSHA welcomes feedback and dialogue to build on these efforts. The path forward is ripe for collaboration and innovation. Together we can work toward an integrated vision of sustainability that protects the environment for future generations, ensures long-term economic viability, and allows all people to thrive and flourish.

Engage with us @OSHA_DOL or sustainability@dol.gov

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Organization of this Document

This document, which focuses on the intersection of OSH and sustainability, is the product of OSHA's efforts described in Appendix A. It is organized to follow our exploration of the sustainability landscape—understanding what sustainability is and the connections between sustainability and OSH, identifying key areas of current activity in sustainability, gaining insight about the factors that are driving these activities, and finally outlining potential actions for leveraging sustainability to advance worker safety and health.

This document is intended for two distinct audiences. First, the OSH community and safety and health professionals can utilize this work to recognize new opportunities for their efforts and a path for moving beyond their traditional roles. Second, individuals and organizations engaged in sustainability from a variety of perspectives can utilize this work to understand how they can better articulate and integrate OSH issues into their work and the benefits of doing so.

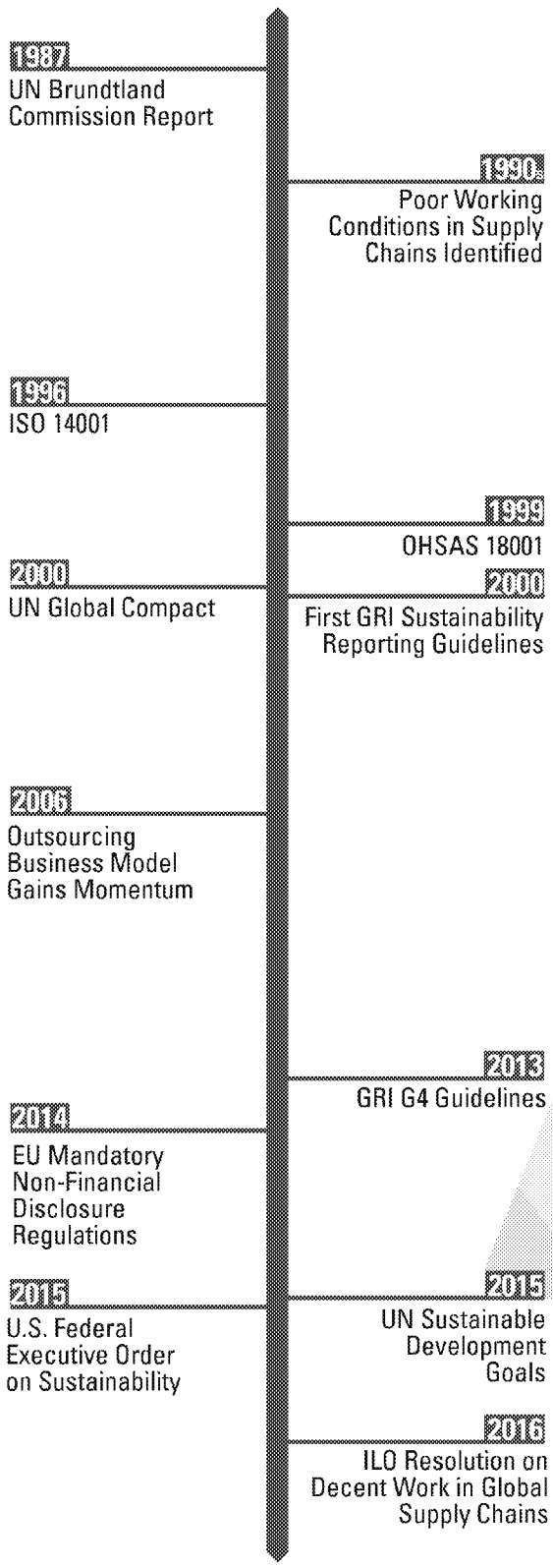
SUSTAINABILITY: A MOVEMENT

While issues of environmental stewardship and worker safety and health achieved notoriety by the 1970s, sustainability began to emerge as a topic of interest following the release of the United Nations (UN) Brundtland Commission report in 1987.[2] This report provided the initial definition for sustainability and a call to action to preserve the societal, economic, and environmental systems on which we all depend.

> **"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."**
>
> – Our Common Future, UN Brundtland Commission (1987)

Since that time, progress has been made at both global and organizational levels on sustainability. In the early 1990s, poor working conditions in supply chains became highly visible as a result of consumer campaigns and have since continued to evolve towards increased accountability and transparency. At the same time, systematic approaches to both environmental and OSH management (e.g., ISO 14001, OHSAS 18001) were developed and integrated into global business practices. In 2000, the UN Global Compact made strides toward aligning business with global sustainable development principles and the introduction of sustainability reporting guidelines spurred growth in individual organizations (companies, local and state governments, etc.) using sustainability as a platform for decision-making and transparency.

More recent efforts have focused on increasing transparency, developing global and national goals, and addressing emerging issues (e.g., climate change, supply chain sustainability). For example, in 2014, the European Union issued a Directive that places mandatory disclosure requirements for non-financial and diversity information on large companies.[3] In 2015, the UN adopted 17 sustainable development goals (SDGs) as a part of the 2030 Agenda for Sustainable Development[4] and in the U.S., Executive Order 13693, Planning for Sustainability in the Next Decade, which sets goals for maintaining Federal leadership in sustainability, was issued.[5] In 2016, the International Labour Organization's (ILO) Committee on Decent Work in Global Supply Chains adopted a resolution and a set of action-oriented conclusions to bridge



Sustainability Timeline. Adapted from: Hill, D.C. and Seabrook, K.A. (2013). Safety & Sustainability: Understanding the business value. Professional Safety.

Worker Safety and Health Considerations in the UN Sustainable Development Goals

On January 1, 2016, 17 UN Sustainable Development Goals (SDGs), adopted in September 2015 at a historic United Nations (UN) Summit, officially came into force. Each of the goals, which include specific targets to be achieved over the next 15 years, are meant to inform and guide strategies for governments, the private sector, civil society, and individuals. Because of their wide acceptance and broad applicability, some organizations are using the UN SDGs to underpin their sustainability efforts.

A number of the SDGs have direct and indirect connections to worker and labor issues. For example:

GOAL #8: Decent Work and Economic Growth

- Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment
- Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms
- By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value

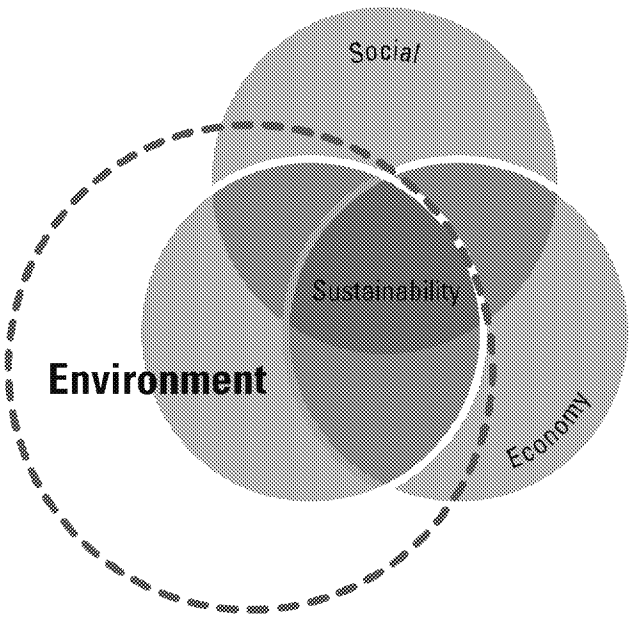
GOAL #12: Responsible Consumption and Production

- By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment
- Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

http://www.un.org/sustainabledevelopment/

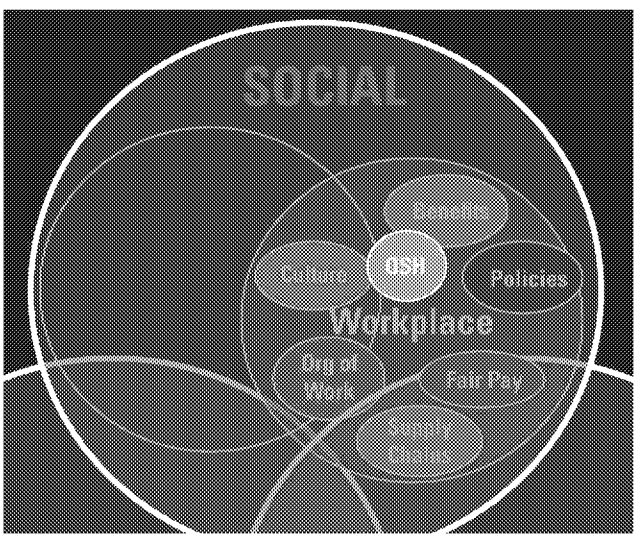
OSH-SUSTAINABILITY CONNECTION

governance gaps and address labor concerns throughout global supply chains.[6]



The three pillars of environment, society, and economy are frequently used to model how sustainability can be incorporated into an organization's mission, goals, and practices. The "three Venn" diagram is a well-recognized visualization of these pillars. Each of the pillars is considered essential for sustainable outcomes to be achieved. To date, the environmental community has effectively leveraged the sustainability movement to advance improvements in environmental outcomes, such as resource usage and emissions reductions, through increased awareness, the establishment of a collective vision, investment in innovations, and promotion of transparency.

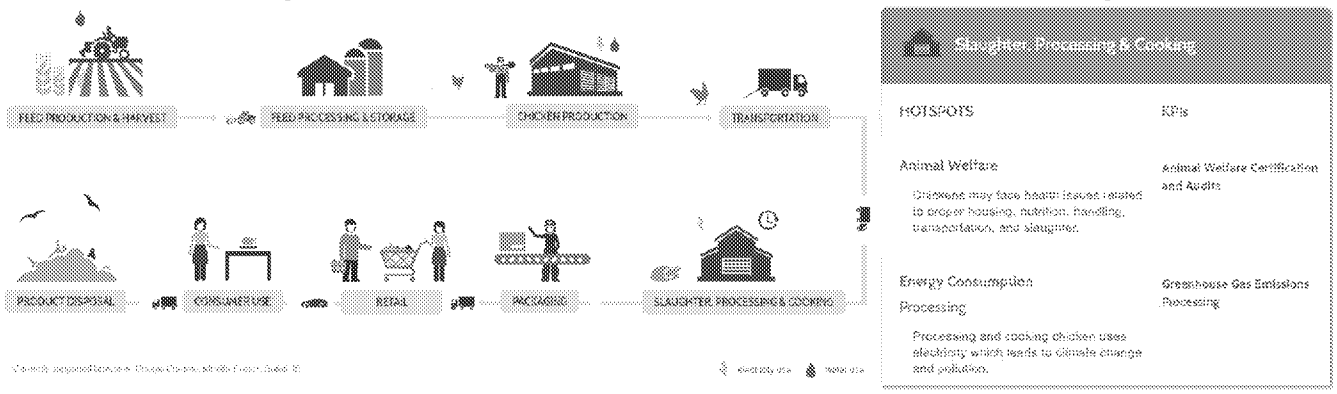
The issues that are most often classified under the social sphere of sustainability (e.g., OSH, human rights, labor relations, community engagement, diversity, equity, benefits and compensation, the organization of work, supply chains, culture) are less understood and have gained less attention. This has led to people siloing sustainability; using the concepts of "environmental sustainability" and "social sustainability" rather than an integrated vision for sustainable outcomes. This singular focus on any one aspect of sustainability can result in unintended negative impacts (e.g., hazards to workers arising from improvements to reduce environmental impacts) or creating tension between goals (e.g., labor and environment).



Although there are many worker issues embedded within the concept of sustainability, there is a unique opportunity to advance OSH through this framework. In this context, OSH refers to the promotion of the safety, health, and welfare of workers. Utilizing

a sustainability framing provides a way to reimagine approaches for protecting workers and raises new issues to explore and opportunities for innovation.

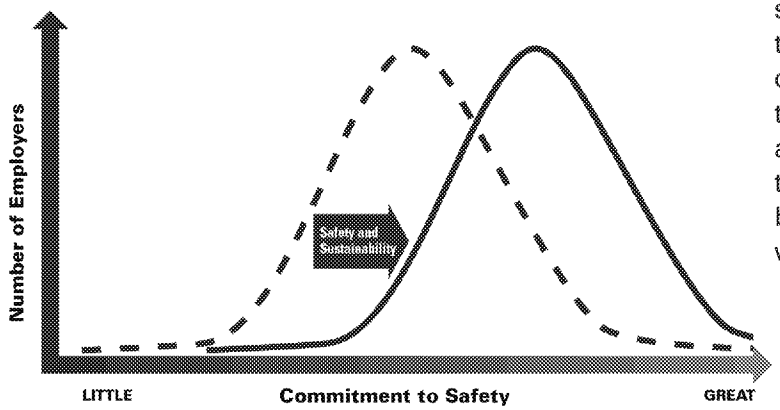
Existing gaps in current sustainability thinking highlight one opportunity to leverage the power of this movement to advance OSH simply by being part of the conversation. For example, the work of the Sustainability Consortium,[7] a global organization of manufacturers, retailers, suppliers, service providers, non-governmental organizations (NGOs), civil society organizations, governmental agencies, and academics dedicated to improving the sustainability of consumer products, highlights how worker safety and health is often left out of current sustainability discussions. In mapping hotspots and improvement opportunities in product supply chains, this effort's methodology failed to identify any worker safety and health issues in the slaughter,



The Sustainability Consortium's Chicken Supply Chain Visualization. Screen Capture. 11/8/2016.

processing, and cooking of chicken. However, we know that workers in this industry suffer elevated rates of injury and illness, toiling long hours in difficult conditions.[8]

Fully articulating and integrating OSH within sustainability efforts can help expand the thinking of those already involved in sustainability and also provide a platform for OSHA and the community of safety and health professionals to move beyond traditional roles. Given the traction and the momentum of the sustainability movement, this type of engagement can be used as a transformative force to amplify the impact on the lives of workers, both inside and outside the workplace.



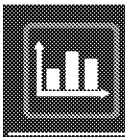
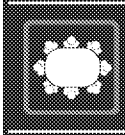
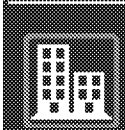
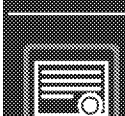
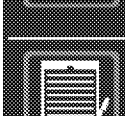
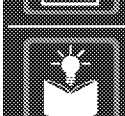
Shifting the Safety Curve. This graphic representation illustrates the commitment to safety in American workplaces, highlighting the range of current efforts. Fully articulating and integrating OSH within sustainability efforts provides an opportunity to drive a larger number of workplaces to make a stronger commitment to safety.

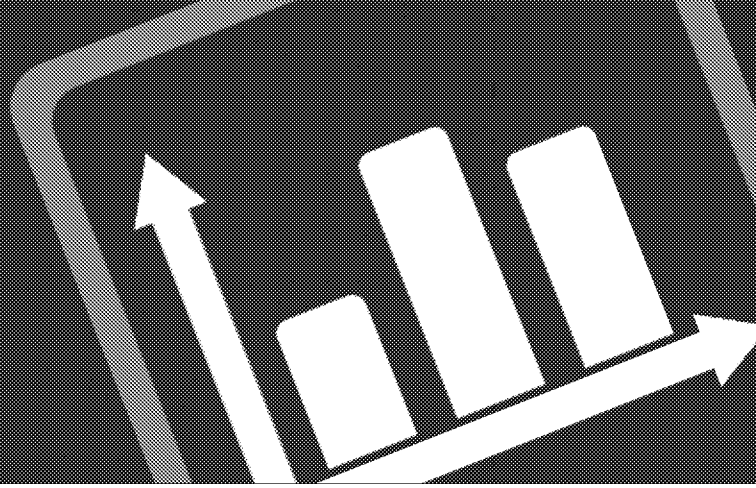
LESSONS LEARNED:

AREAS OF SUSTAINABILITY ACTIVITY

Current sustainability efforts are focused in seven areas of activity: reporting and metrics, investing and shareholder engagement, business, standards and certifications, procurement, education, and research. Based on our conversations with stakeholders, opportunities and challenges for advancing worker safety and health in each of these areas were identified. The project methodology and a complete list of those that participated in the project are included in Appendices A and B. It is anticipated that there will be continued engagement with identified and not yet identified stakeholders to further explore these topics.

The table illustrates stakeholders that provided insight into each of these areas and the primary topic of our conversations with them. As many of the stakeholders we spoke with are active in a number of sustainability efforts, the diagram is not inclusive of all efforts, initiatives, and areas of expertise that may be ongoing or planned by the stakeholders listed.

	**Reporting and Metrics:** Center for Safety and Health Sustainability (CSHS), Ceres, Corporate Knights, Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB)
	**Investing and Shareholder Engagement:** AFL-CIO, Bloomberg Intelligence, National Conference on Public Employee Retirement Systems (NCPERS), Pax World Management LLC, Sustainalytics, UAW Retiree Medical Benefits Trust, US SIF: The Forum for Sustainable and Responsible Investment
	**Business:** American Sustainable Business Council (ASBC), Aspen Institute, Baxter International Inc., Campbell Soup Company, C&A Foundation, GreenBiz.com, Kaiser Permanente, ORCHSE Strategies, Perry's Ice Cream Company, Phylmar Regulatory Roundtable – OSH Forum, Siemens Healthineers, The Dow Chemical Company, The National Association for Environmental Management (NAEM)
	**Standards and Certifications:** Aluminum Stewardship Initiative (ASI), American Chemistry Council (ACC), B Lab, bluesign technologies ag, Business and Institutional Furniture Manufacturers Association (BIFMA), Institute of Scrap Recycling Industries, Inc. (ISRI), National Institute of Standards and Technology (NIST), NSF International, Specialty Graphic Imaging Association (SGIA), Sustainable Apparel Coalition (SAC), U.S. Green Building Council
	**Procurement:** EcoVadis, Sustainable Purchasing Leadership Council (SPLC), UL, U.S. Environmental Protection Agency (EPA), U.S. General Services Administration (GSA)
	**Education:** Arizona State University, East Carolina University, George Washington University, Institution of Occupational Safety and Health (IOSH), Oregon State University, University of Massachusetts Lowell, Utrecht University
	**Research:** Campbell Institute, CPWR – The Center for Construction Research and Training, Harvard School of Public Health, National Institute for Occupational Safety and Health (NIOSH)



REPORTING AND METRICS

The public reporting of environmental, social, and governance (ESG) issues began in the 1980s with corporate environmental reporting.[9] This expanded to corporate social responsibility (CSR) reporting, which now is essentially synonymous with sustainability reporting in many cases, the terms often being used interchangeably. Currently, sustainability reporting is becoming a common practice for organizations ranging from businesses to governments to NGOs. This sort of reporting is considered non-financial reporting and is most often voluntary. Organizations are self-selecting what issues are included in their reports. This selection can be based on a variety of mechanisms, including industry expectations, organizational values, data quality and availability, consumer demand, formal materiality assessment, or more recently, the UN SDGs. With this growth in disclosure, there has also been a move to increase the rigor of sustainability reporting through the development of organizations and tools to standardize practices and metrics. There have been a few efforts in some countries (e.g., European Union) to make ESG disclosures mandatory for companies of a certain size or in certain industries.

Material issues are ones that can "reasonably be considered important for reflecting the organization's economic, environmental and social impacts, or influencing the decisions of stakeholders."

— Global Reporting Initiative. (2016). GRI 101: Foundation. Global Reporting Standards. https://www.globalreporting.org/standards

The Global Reporting Initiative (GRI), established in 1997, developed a reporting framework that has become the most adopted model used for sustainability reporting around the globe. Since its initial version, the framework has undergone several iterations in an effort to increase rigor and applicability.[10] There are several other organizations, including the Sustainability Accounting Standards Board (SASB)[11] and the International Integrated Reporting Council (IIRC)[12], that are especially active.

Many people, regardless of their primary area of activity in the realm of sustainability, considered metric development and use critical challenges to be solved. It is essential to be able to identify what measures are important, when they should be reported, how they should be calculated and standardized, and how to compare across years, organizations, and geography. Efforts are ongoing through reporting organizations, trade associations, professional associations, standards development groups, investing and financial organizations, and companies themselves to address these challenges through the development of tools (e.g., The Vitality Group Reporting on Health Roadmap)[13], indices (e.g., The Harvard SHINE Well-being Index[14]), workgroups and collaborations, and recommended metrics and methodologies (e.g., the Center for Safety and Health Sustainability's Best Practices Guide for Occupational Health and Safety in Sustainability Reports[15]).

Essential Elements	Organizational Structure and Reporting Relationships	OSH staffing levels.
		Reporting relationships.
		Board of Director oversight.
	The Scope of the OSH Programs	Scope of coverage, including all organizational sites, facilities, business units, business operations, suppliers, and contractors, and noting any limitations or exclusions (e.g., subsidiaries, joint ventures (or other partnerships), and recent acquisitions or divestments).
	OSH Policy/Codes of Conduct	Summary of top-level OSH policy and/or codes of conduct.
	OSH Management System	Description of OSH management system (e.g., proprietary approach, nationally or internationally recognized standard or guideline).
		Date of certification or registration if the management system has been registered or certified by a third party auditor.
	OSH Program and Performance Auditing	Approach to external auditing of the OSH program and its performance.
	OSH Performance Reporting	Lost-time injury and illness frequency rate, lost-time injury and illness severity rate, and number of fatalities (all employees/ workers – 5 year period).
		Lost-time injury and illness frequency rate, lost-time injury and illness severity rate, and number of fatalities (all contractors – 5 year period).
		% of owned or leased manufacturing, production, or warehousing facilities that have implemented an OSH management system that meets a nationally or internationally recognized standard or guideline.
		% of owned or leased manufacturing, production, or warehousing facilities that have had their OSH management systems audited.
		% of direct/first tier suppliers' facilities that were audited for compliance with OSH standards.
Optional Elements	OSH Targets	Metrics that provide performance against continual improvement goals or targets (e.g., reduce lost time injuries by 20% over 3 years).
	OSH Involvement in Capital Investments	Programs and approaches to assure OSH oversight of capital investments for new construction or equipment, process redesign, expansion, modernization, etc., including trigger points that would initiate OSH oversight.
	Worker Involvement	Worker participation in areas such as OSH committees, union OSH representation, joint inspections and investigations, job safety analyses, risk assessments and other areas such as kaizen teams and strike teams.
	OSH Training	Nature and extent of training for all levels.
	OSH Risks	Description of risk management process used to identify and manage health and safety risks.
		Key OSH risks and mitigation strategies.
	Other Descriptive Items/ Metrics	Special programs such as safety fairs, campaigns, community programs and awards, recognition programs, wellness programs, return to work programs, third party manufacturing metrics, other indicative or predictive performance metrics (e.g., workers exposed above recommended exposures but with safety equipment, safety culture indicators, behavioral safety observations, workers at risk, etc.).

Proposed OSH Elements for Sustainability Reporting. Adapted from CSHS Best Practice Guide for Occupational Health and Safety in Sustainability Reports.

In addition to company reporting, there have been efforts to develop rankings and indices for use by groups, including investors, looking to incorporate the information reported by companies into their decision support tools. Some of the popular rankings and indices include: the Dow Jones Sustainability Index,[16] the Corporate Knights Global 100,[17] and the MSCI Global Sustainability Index.[18] The assessment of information for inclusion in these indices and rankings is highly dependent on what information is publicly available or self-reported. It is difficult to include health and safety as a factor in these rankings based on the sporadic nature of reporting on OSH and inconsistency in the metrics used when information is provided on these issues.

Opportunities

- **UN Sustainable Development Goals:** The nearly global acceptance of the UN SDGs offers a unified context for organizations to develop and advance their own sustainability goals and efforts. The SDGs provide targets that are applicable to governments, civil society, and the private sector. While not every goal and target will be applicable to every organization, a number of organizations, such as Unilever,[19] PwC,[20] The Dow Chemical Company,[21] and the World Health Organization,[22] are viewing the SDGs as an opportunity for developing strategy, accountability, and innovation.

- **Increasing the Salience of OSH as a Sustainability Issue:** To date, the inclusion of OSH in sustainability reporting is highly dependent upon industry sector. As sustainability reporting expands to include additional social aspects, there is an opportunity to increase the prevalence of reporting on OSH and the metrics that are used by more fully articulating and defining the path forward in this area.

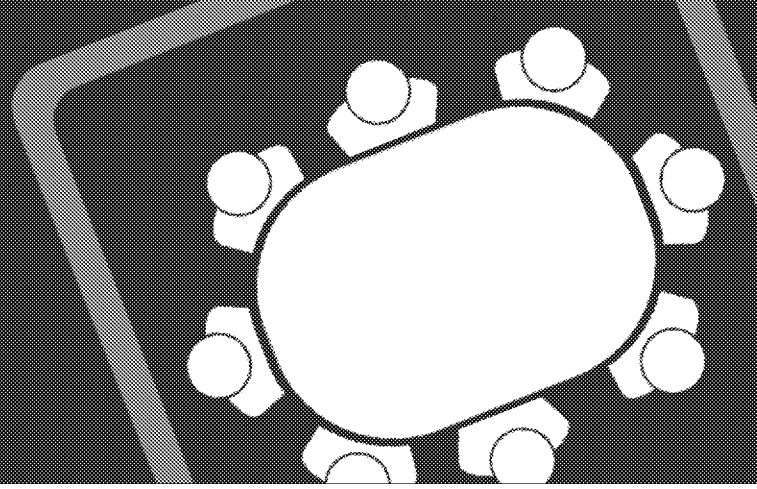
How are you accounting for impacts on the safety and health of workers?

Challenges

- **Voluntary Nature of Reporting:** Currently, in the U.S., sustainability reporting is voluntary and most often not driven by regulation. NGOs, the investment community, and consumers are driving what is reported and are demanding more robust and effective disclosure. Even when people do report on OSH, the way the information is reported makes it difficult to compare. The voluntary nature of reporting means that the information available to investors and the public remains inconsistent and incomplete.

- **Leading Metrics:** Leading indicators, in addition to the more commonly used lagging indicators for OSH, are needed. These metrics can be difficult to develop and use due to comparability challenges, but also because there is a lack of industry-specific evidence of financial impact related to safety and health.

- **Disconnect Between OSH Professionals and Business Leadership:** Incorporating information into high-level reporting channels in organizations often falls beyond the normal functions of most OSH professionals. Primarily seen as technical specialists, they are not typically involved in discussions about business goals and opportunities.



INVESTING AND SHAREHOLDER ENGAGEMENT

Sustainable, responsible, and impact investing and shareholder engagement integrate ESG criteria into the investment process. Those engaging in these types of activities do so by considering ESG criteria from a variety of sources (e.g., financial disclosures, non-financial disclosures, and indices and rankings[23]) in their decision-making, as well as by utilizing shareholder engagement strategies, such as letters, resolutions, proxy votes, and meetings, to advocate for ESG issues.

In 2014, U.S.-domiciled assets under management incorporating ESG considerations into decision-making and shareholder engagement strategies rose to $6.57 trillion, a growth of more than 900% since 1995.[24] This growth is driven by a number of developments, including: (1) increased evidence of the impacts of ESG concerns; (2) increasing interest to seek out investments that fulfill personal values, goals, and institutional missions as well as aim for strong financial performance; (3) seeking hidden sources of financial outperformance over the long term; (4) pursuing an investment discipline that manages risk and fulfills fiduciary duties; (5) growing body of academic research that shows a strong link between ESG and financial performance; and (6) millennials who are looking to not only make a return on their investments, but to also make a difference.

U.S. Department of Labor Guidance on Incorporating ESG Considerations into Decision-making

In 2015, the U.S. Department of Labor issued guidance outlining the ways in which ESG considerations could be incorporated into decision-making. For example, they can be considered as "tiebreakers" when investments are otherwise equal with respect to their economic and financial characteristics. In cases where ESG factors may have a direct relationship to the economic and financial value of an investment, they can be considered as proper components of the fiduciary's analysis of the economic and financial merits of competing investment choices.

https://www.dol.gov/opa/media/press/ebsa/ebsa20152045.htm

As a field, sustainability is pushing heavily into investing for non-financial risks and opportunities. Human capital management,which includes considerations of workplace safety and health, encompasses a broad range of corporate practices that are of particular interest in this regard. According to the California Public Employees' Retirement System (CalPERS), "the scope of human capital management includes a company's direct employees, as well as the employees of vendors in the company's supply chain. In addition, human capital management encompasses a broad range of corporate practices, including but not limited to: hiring and retention, training, compensation, fair labor practices, health and safety, responsible contracting, and diversity and inclusion."[25]

While OSH is generally considered to be important, particularly as it relates to governance and leadership performance, metrics used to assess OSH performance are not consistent in use or application. This information gap makes it challenging, if not impossible, for OSH to be considered material to an investor's decision-making process. Information about safety and health performance is only required in quarterly and annual reports to the U.S. Securities and Exchange Commission (SEC) from mining companies (see box for additional detail). There are several efforts underway to make similar information more broadly available in these types of financial filings. Other efforts to date have focused on gaining the attention of chief executive officers (CEOs) and board members through non-binding shareholder resolutions.

Required Mine Safety Disclosures, U.S. Securities and Exchange Commission

In December 2011, the U.S. Securities and Exchange Commission (SEC) announced new rules implementing the Dodd-Frank Wall Street Reform and Consumer Protection Act's requirement that mining companies disclose safety information in the quarterly and annual reports they file with the SEC.

Items required for disclosure include but are not limited to:

- The total number of flagrant violations under Section 110(b)(2) of the Federal Mine Safety and Heath Act (Mine Act).
- The total number of imminent danger orders issued under Section 107(a) of the Mine Act.
- The total dollar value of proposed assessments from MSHA under the Mine Act
- The total number of mining-related fatalities.
- A list of the mines that receive notice from MSHA of a pattern of violations of mandatory health or safety standards that are of such nature as could have significantly and substantially contributed to the cause and effect of coal or other mine health or safety hazards under Section 104(e) of the Mine Act.

Any occurrence of a violation, order, or other event from the list of required disclosures must be reported; no materiality threshold applies.

https://www.sec.gov/news/press/2011/2011-273.htm.

In 2016, researchers found a decrease in mining-related citations and injuries among the mines owned by SEC-registrants as compared to those that are not registered.

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2680296.

Opportunities

- **Risk Approaches:** Viewing OSH as a business risk rather than an operational function can drive its inclusion in internal audits and enterprise risk analysis. A number of practitioners in this field have identified the advantage of expanding audit and risk analysis beyond financials to include applied approaches, policies, and control mechanisms.

- **Materiality of OSH:** U.S. law requires publicly listed companies to disclose material information, defined by the U.S. Supreme Court as information presenting "a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the 'total mix' of information made available."[26] However, there is no universally agreed upon definition for materiality in relation to non-financial factors, such as OSH. There has been criticism of efforts to develop universal

materiality determinations based on industry sectors as some feel that materiality varies at a smaller scale (i.e., from company to company). While the method used in the determination of materiality may still be debated, access to information and data is a common need no matter the method. Even lagging indicators can provide information about potential risks to investors. These data need to be publicly available and able to be aggregated and identified to the parent company (e.g., stock ticker identifier).

- **Transparency:** Organizations are trying to push information release requirements through the SEC. The SEC recently asked for public feedback on business and financial disclosures required by Regulation S-K,[27] through a concept release. A joint report released by several coalitions noted that more than 26,000 comments were submitted to the SEC, with many commenters expressing clear support for expanded and enhanced disclosures, including disclosures on sustainability topics.[28]

- **Emerging Topics:** There are a number of macro trends that are contributing to interest in ESG considerations including supply chain risks, climate change, human capital, and rising economies. As many engaging in ESG opportunities are interested in long term investing (e.g., 20-30 year time horizons), investors are not as constrained by conventional economic frameworks or deterred by the complexities of working towards solutions in these areas.

What data do you need to make OSH a central component of your investment and financial decision-making?

Challenges

- **Education:** Sustainable, responsible, and impact investing and shareholder engagement that integrates ESG criteria into decision-making are still considered specialized areas of activity, although they are becoming more mainstream. Business schools are beginning to incorporate these concepts into their programs, and some educational courses and certifications that include ESG topics are available, but additional training and curriculum are needed to increase the knowledge base for these types of investing strategies.

- **Reporting is Not Required:** To date, companies have not had to report their safety and health data to OSHA, though this will change for a certain subset of companies that are required, beginning in 2017, to electronically submit their injury and illness data.[29] Even where companies are voluntarily making their safety and health information publicly available there have not been widespread or accepted efforts to harmonize this reporting for consistency, strength of metrics, or verification. Investor efforts to comprehensively incorporate ESG information into investment decisions are hindered by this lack of comprehensive, comparable, and reliable data.

BUSINESS

As the idea of sustainability within businesses has matured over the last decade, many leading companies are making it a key part of their growth strategy for the future. There have been several drivers for this, which include: increased importance of transparency and reporting, supply chain and customer demand, regulations and voluntary standards, green procurement and contracting, and investing. To meet these demands, sustainability is seen as a way to package and express the core values of a company to outsiders.

"For many organizations, sustainability has evolved from a 'feel good' exercise to a strategic imperative that focuses on economic, environmental and social risks and opportunities which, left unattended, can potentially threaten the long-term success of strategies and the viability of business models."

— Demystifying Sustainability Risk, Committee of Sponsoring Organizations of the Treadway Commission (COSO) (2013)

With these trends, there has also been a move to elevate sustainability positions within companies. While no two organizational structures are alike, the GreenBiz "State of the Profession" report found that there has been a significant increase in the number of vice presidents of sustainability reporting directly to corporate senior executives or the board of directors.[30] Others have also noted that adding Environmental Health Safety & Sustainability (EHS&S) performance into an executive's compensation structure can be a successful strategy for integration.

Over time, businesses have started to move from a focus on environmental sustainability to one that also embraces social aspects. For many businesses, worker safety and health is a non-negotiable value (e.g., "zero harm") that has always been a part of the business model, regardless of how a company views sustainability. In some of these cases, OSH efforts are also seen as a natural fit under a broader sustainability umbrella (e.g., "people, planet, profit"). A recent report by the Campbell Institute at the National Safety Council, which brings together world-class performers in EHS across industry sectors and regions of the world, similarly found that leading companies are taking on "a broader, more holistic view of sustainability, of which safety plays a key role."[31]

To identify focus areas for future sustainability work, as well as reporting, companies have been moving toward detailed materiality assessments to identify those issues that are of importance for both the company and stakeholders. These assessments often include extensive surveys and interviews with internal, as well as external, stakeholders. Worker safety and health is regularly identified as a key issue in these assessments.

Some other strategies currently being used to address worker health and safety issues include: evaluations of the maturity of OSH management systems, design processes that include OSH, culture and perception surveys, worker engagement through EHS committees and teams, close call systems, internal recognition programs, toolkits for workers and managers on safety and health issues, and audits of company and supplier facilities.

Highlighting Worker Safety and Health in Sustainability Reporting

In their annual sustainability report, Baxter International Inc. provided information beyond the typical injury and fatality rates to describe their performance on worker safety and health. In addition to analyzing the main sources of work-related injuries and serious incidents to identify trends and opportunities for improvement, they also highlighted several initiatives on safety program management, including the launch of a "Safety Connection" intranet portal, a key resource that defines critical safety behaviors and provides tools and resources to enhance employee ownership of safety.

Graphic courtesy of Baxter International Inc.

Opportunities

- **OSH as Innovation:** Given the past focus on the environmental aspects of sustainability, OSH can be seen as an innovation area as businesses increase their focus on social aspects. OSH professionals, if engaged appropriately, can use sustainability to drive issues of worker health and safety forward. Worker engagement can also help identify opportunities for innovations that improve not only safety and health, but also business performance.
- **Expanded Understanding of Worker Issues:** Within their sustainability frameworks, many organizations are now moving toward an expanded understanding of worker and workplace issues. This understanding includes a focus on the many aspects of work that need to be addressed in order to reach a truly sustainable workplace that ensures workers are flourishing. This includes providing a healthy, safe work environment, but may also extend to community engagement, volunteering, and other aspects of company practices (e.g., leave policies, wages, employee ownership).
- **Rankings:** Some businesses, especially those that are publicly traded, are motivated to improve their performance to achieve high ranks on various lists, such as the Dow Jones Sustainability Index or the Corporate Knights Global 100. Other companies, even if not public, do not want to see themselves at the top of lists of underperformers in any respect.
- **Collaboration:** Business leaders recognize that many of their sustainability goals cannot be achieved alone. Convening of groups of sustainability leaders, EHS managers, and others that are similarly situated in companies will likely take on more importance going forward.

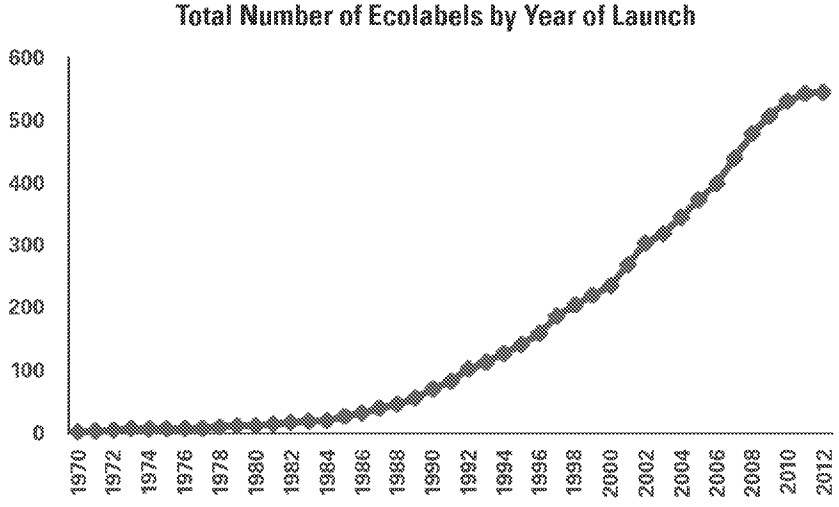
What strategies typically used in sustainability activities (e.g., innovative partnerships, environmental and ethical guidelines) can you use to improve health and safety in the workplace?

Challenges

- **OSH as Cost:** For many businesses, OSH is still viewed largely as a cost to business, rather than as an investment. This is especially the case where lost-time incident rates and fatality rates, the two most commonly used indicators of safety and health performance, are low; people think the problem is solved and further investment in these issues is not needed. Consideration of leading indicators that focus on the ongoing risks to worker safety and health may help dispel issues of complacency around OSH.
- **Lack of Consistency in OSH Reporting:** Even where businesses are regularly considering OSH within their sustainability goals, there is a lack of consistency in global reporting of these issues that makes it challenging to compare, even across the various entities within a global company.
- **Supply Chain:** As business becomes ever more global, supply chain management and engagement is increasingly seen as the next frontier in sustainability. Because worker health and safety issues may be more pronounced in global supply chains, it will continue to be a challenge to highlight the importance of these issues in U.S. supply chains. When evaluating goods and services for sustainability, it is important to also consider safety and health implications for those who are actually performing the services or manufacturing the goods throughout the supply chain, not just those using the final products.
- **Scalability:** As many large, global businesses have made substantial progress in sustainability over the last decade, many small businesses are in the beginning stages of understanding how they can incorporate these issues into their business models to remain competitive. Adapting leading approaches for small and medium enterprises (SMEs) will be critical to ensure that they will be able to take advantage of these innovative and beneficial strategies.

STANDARDS AND CERTIFICATIONS

Over the last several years, the development and use of standards and certifications to define sustainability has exploded, resulting in hundreds, if not thousands, of standards, certifications, and labels for products, materials, and businesses. The graph, based in part on information from the Ecolabel Index, the largest global directory of ecolabels, depicts the rapid growth in predominantly consumer-facing labels, which make up just a small portion of the overall standards and certifications picture. Currently, the Ecolabel Index is tracking 465 ecolabels in 199 countries and 25 industry sectors.[32] Much of this development has been in the environmental, or "green" space, but there are others that address discrete issues that fall under the social aspect of sustainability (e.g., child-labor-free), as well as those that attempt to incorporate all aspects of sustainability (e.g., B Impact Assessment).[33]



Evolution in the Total Number of Environmental Labelling and Information Schemes
© OECD. Taken From: Gruère, G. (2013). "A Characterisation of Environmental Labelling and Information Schemes", *OECD Environment Working Papers*, No. 62, p. 23, OECD Publishing. http://dx.doi.org/10.1787/5k3z11hpdgq2-en.

Even where broader environmental and social aspects are targeted by a standard or certification, some explicitly include considerations of worker health and safety (e.g., Responsible Care,[34] Sustainable Green Printing Partnership (SGP),[35] Aluminum Stewardship Initiative (ASI),[36] Business and Institutional Furniture Manufacturers Association (BIFMA)[37]). Where these issues are considered, compliance with existing laws and regulations is often the criterion for evaluation. In some cases, considerations of systems to manage occupational hazards or an evaluation of lagging indicators are also included. Other standards, while not explicitly focusing on worker safety and health, do present opportunities to consider impacts to workers through their consideration of "human health" impacts (e.g., Leadership in Energy and Environmental Design (LEED)[38]).

The development of standards and certifications involves several key players: standards development organizations, who convene stakeholders and facilitate the development process; certifiers, often, but not always, a third party who completes the auditing associated with the

standard; and users, who undertake the process to get their products, materials, or businesses certified to a particular standard. In many ways, the composition of stakeholders at the table in the standards development process can determine what factors will be emphasized. The process for developing standards and certifications, the mechanisms used to determine how standards are met (e.g., weighting systems, point systems, mandatory/voluntary credits), and the ways in which auditing or certification occurs can all vary greatly from standard to standard.

Supply chain demand is a key driver for both the development and uptake of standards and certifications. In some supply chains, external pressures from governments, NGOs, and consumers have resulted in industry participants coming together to provide a common standard or certification for their industry (e.g., Responsible Jewellery Council,[39] Electronic Industry Citizenship Coalition[40]). In other supply chains, this pressure has manifested itself as the creation of multiple tools, standards, and systems (e.g., apparel industry—bluesign,[41] Higg Index,[42] supplier codes of conduct). In some cases, industry sectors feeling pressures from their supply chain have developed their own standards to better suit their industry when existing frameworks or standards are too broad to be useful to them (e.g., SGP).

Benchmarking Performance and Providing Resources for Improvement

As part of the American Chemistry Council's Responsible Care® program, safety and health performance is measured and publicly reported to provide information about how companies that are certified to the Responsible Care Management System have improved over time and how they compare to others in the industry that are not certified. Employees in member companies and partner organizations can also take advantage of the Responsible Care network's resources, including the opportunity to: pose questions about specific issues and survey the network for solutions; receive mentoring from other members; access toolboxes, excellent practices, tutorials, and checklists on various topics; and participate in periodic webinars and workshops.

Graphic taken from ACC Responsible Care Fact Sheet. http://responsiblecare.americanchemistry.com/FactSheet.

For some standards, trade associations, industry sectors, and parts of the supply chain that are demanding participation by suppliers (e.g., brands, retailers) also provide technical support. In other cases, communities of users have come together to share their experiences and provide support for others that are similarly situated (e.g., LEEDuser[43]).

Standards and certification also influence other areas of current work in the sustainability landscape. For example, some reporting frameworks look to established or commonly used standards and certifications to drive their evaluations. Businesses striving to be more sustainable also look to standards and certifications to showcase their leadership and to align practices throughout their supply chain. Institutional and business to business procurement efforts also use standards and certifications to set their requirements for what products to purchase or suppliers to engage.

Opportunities

- Technical Support: Given the rapid development and updating of standards and certifications, there is a place for providing input on worker safety and health into these processes. Where standards and certifications do have options that include an evaluation of this aspect, there may be opportunities available to provide tools, resources, and expertise to support implementation and facilitate use.

What factors would you incorporate into sustainability standards and certifications to ensure the safety and health of workers is protected?

Challenges

- Credibility: With so many standards and certifications available, credibility is a key challenge. Methods to determine whether a certified business or product is in fact more "sustainable" or has superior performance for all of the evaluated aspects need to be developed, especially for entities that use standards and certifications as part of their decision-making.
- Benchmarking: A lack of benchmarking also contributes to the inability to understand whether there are actual improvements or differentiation between those businesses and products that are certified as "sustainable" and those that are not.

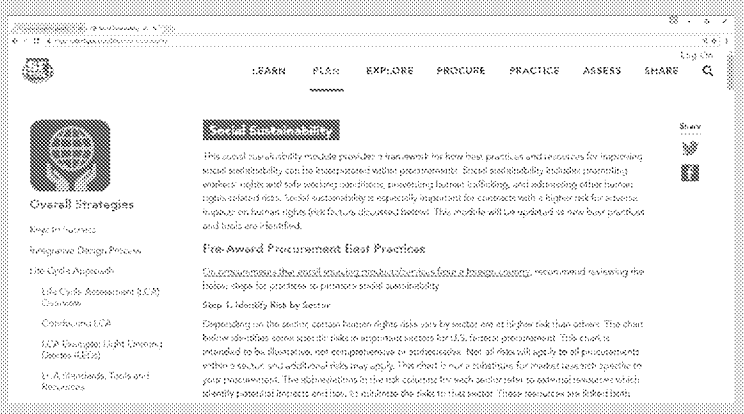
PROCUREMENT

Procuring products and services is a critical activity for both businesses and government organizations, especially those that are not involved in making products or delivering services themselves. As such, procurement is a key avenue these entities can utilize to advance sustainability.

The U.S. General Services Administration (GSA)[44] and the U.S. Environmental Protection Agency (EPA)[45] have been leaders in this area, implementing the sustainable procurement goals for products and services for the federal government.[46] On its Sustainable Marketplace website,[47] EPA provides assessments and recommendations of specifications, standards, and ecolabels in order to provide federal agencies and vendors "a transparent, fair, and consistent approach to using private sector standards and ecolabels that create positive, measurable, and meaningful change in the environmental performance of products and services procured by the U.S. Government. GSA has created SFTool.gov,[48] which includes modules for incorporating various aspects of sustainability into procurement. Other federal agencies (e.g., U.S. Army,[49] U.S. Postal Service[50]), as well as state and local governments (e.g., California,[51] Seattle[52]), are linking their procurement practices, focusing mostly on environmentally preferred and "green" purchasing options, to sustainability goals.

Incorporating Social Sustainability into Procurement

GSA's Sustainable Facilities Tool (sftool.gov) provides assistance to take action to make buildings, purchases, and operations more sustainable. The tool's social sustainability module provides a framework for how best practices and resources for improving social sustainability, including promoting workers' rights and safe working conditions, preventing human trafficking, and addressing other human rights-related risks, can be incorporated within procurements.



Screen capture. 11/8/2016.

While there is a lot of action within governments around sustainable procurement, businesses are also looking to incorporate sustainability aspects into their everyday procurement practices. For example, some companies are using collaborative platforms like EcoVadis[53] to access evidence-based ratings that help buyers make better decisions about their suppliers and help suppliers validate their sustainability management systems with an eye toward continuous improvement. Major retailers have also been using similar tools, such as GreenWERCS,[54] to evaluate the chemical content of formulated products before making a decision to stock it on their shelves. Additionally, groups, such as the Sustainable Purchasing Leadership Council (SPLC),[55] have formed to provide a collaborative space in which organizations and individuals can come together to enhance clarity, consistency, and coordination around sustainability in procurement.

There have also been attempts at shifting consumer purchasing through the development of online databases and apps, such as the Good Guide®[56] and Skin Deep®.[57] These efforts have focused largely on educating consumers about the chemical content of the cleaning and beauty products that they use every day, making the direct connection between the use of these products and personal adverse health impacts (e.g., asthma, endocrine disruption, cancer). While these efforts have demonstrated some impact on consumer purchasing of specific products, making general information about the environmental and social impacts of products available to consumers has not been shown to similarly drive purchasing decisions. Those with experience in these types of efforts still find that business to business purchasing, rather than business to consumer purchasing, provides a greater opportunity to influence decision-making through information and support tools.

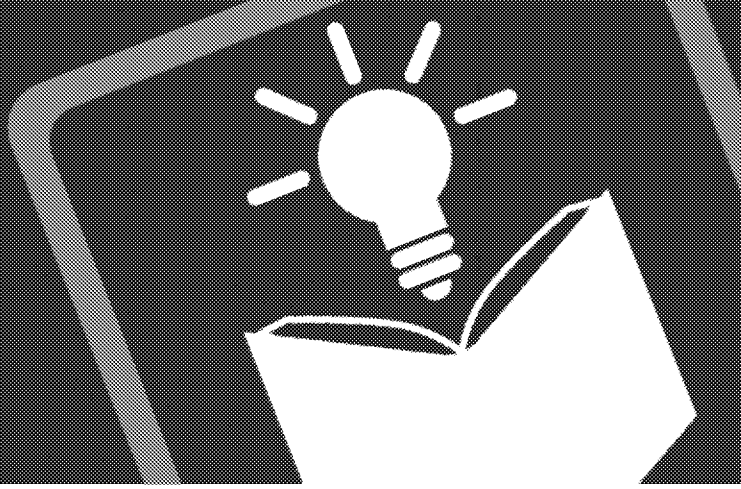
Opportunities

- **Magnitude:** Procurement has the potential to make a large impact given the magnitude of purchasing by businesses, governments, and consumers.
- **Focus on Services:** While many procurement efforts to date have been focused around products, there is a trend to also consider the procurement of more sustainable services. Services may provide a better opportunity than products for worker health and safety to become a part of the sustainability conversation.

Are the sustainable products and services you are procuring also safer and healthier for workers?

Challenges

- **Existing Standards, Certifications, and Labels:** Although procurement is a driving force in sustainability, purchasing decisions are most often predicated on standards, certifications, and labels that outline which criteria should be considered. Until these standards, certifications, and labels include OSH aspects, it may be difficult to use these tools to advance OSH.
- **Narrow Focus on Environmental Aspects of Sustainability:** Given that many of the existing standards, certifications, and labels have been developed from the environmental perspective, many procurement programs focus on "environmental performance standards" and "ecolabels," rather than broader "sustainability standards." As more standards and labels that are inclusive of social, as well as environmental aspects, are developed, this narrow environmental framing could be a barrier.



EDUCATION

Educational opportunities for future health and safety professionals and business leaders can be found within a range of academic areas including public health, engineering, construction management, business management, environmental management, and finance. Often these curricula are siloed such that potential synergies, for example, between safety and health and business, are not recognized. OSH professionals educated in this way are often not prepared to make a business case for improving safety and health practices beyond compliance. Similarly, business leaders are not prepared to recognize how OSH can be used as an innovative strategy that will realize benefits for their organization. Ensuring that worker safety and health moves beyond a workplace function to an integrated business strategy is critical to the success of both OSH professionals and business leaders.

Given that many schools and universities are not currently educating across these disciplines, a whole population of current professionals would benefit from additional training opportunities that address these synergies. For example, the Institution of Occupational Safety and Health (IOSH)[58] is in the process of developing a competency framework for OSH professionals that includes not only technical capacity, but also business strategy issues.

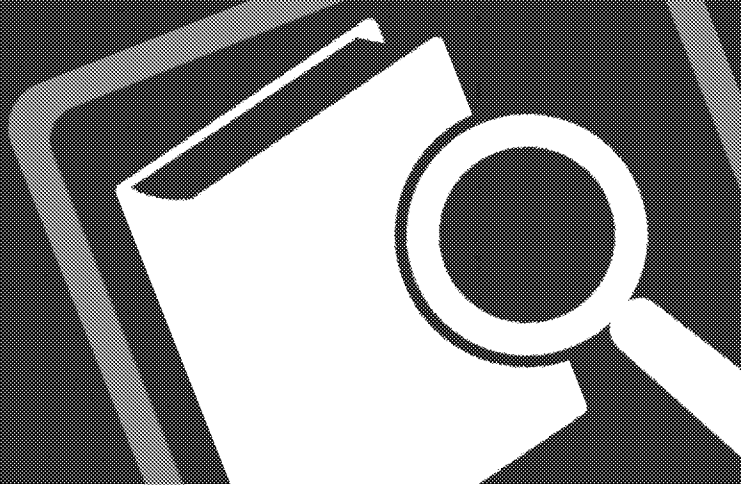
Opportunities

- **Curriculum and Training Development:** Further integration and inclusion of social sustainability concepts into education and training for next generation and current professionals can bring attention to safety and health as a business strategy.

How can you prepare EHS professionals to be involved in the strategic decisions made by sustainability policy makers and executive management?

Challenges

- **Institutional Barriers:** The lack of institutional interdisciplinary opportunities has constructed silos around various academic programs. There are limited mechanisms available to create a space for discussing cross-cutting issues. Barriers to revising or adding new topic areas to curriculum also preclude this sort of interdisciplinary engagement from occurring.



RESEARCH

Much like education, research conducted by academics, NGOs, government agencies, and membership organizations is siloed; researchers study labor issues or sustainability, but not usually both. Research that connects occupational safety and health and sustainability is occurring in a limited manner in specific fields (e.g., green jobs, chemical management, life cycle assessment). In general, even though workers are vital to the long term success of organizations, when most people look through the conventional lens of sustainability, they do not understand that workers should be included.

Opportunities

- **Business Case Development:** One of the primary areas of research needed surrounds the development of business cases demonstrating the integration of OSH and sustainability. In particular, the way that costs are accounted for, as OSH costs are often transferred elsewhere, challenges traditional economic models.
- **Horizon Scanning:** Emerging issues impacting workers (e.g., aging workforce, worker well-being, nanotechnology, green chemistry) are a potential path for integrated sustainability research. For example, climate change is one of the most talked about areas of sustainability and workers have been and will continue to be disproportionately impacted. It will be critical to recognize exposures, anticipate hazards and responses, and possible adaptation mechanisms for these responses (chemicals, pathogens, conflict, heat, etc.).

How could new research support the inclusion of OSH in sustainability strategies?

Challenges

- **Funding:** Researchers need funding for their work. As the requests for proposals and review procedures often follow traditional processes, it can be difficult to secure funding for research and activity in areas that have not yet been proven to provide fruitful outcomes or are interdisciplinary in nature (e.g., worker impacts from climate change).
- **Traditional Publication Venues:** The target audience for much of the research related to sustainability does not necessarily read academic journals, which is where researchers tend to publish. Innovative communication channels could be better utilized to disseminate research outcomes.
- **Scope:** Much of the research being conducted in safety and health and sustainability is occurring in discrete and specific areas potentially limiting its applicability.

LESSONS LEARNED: DRIVERS AND LEVERAGE POINTS

As noted in the mental model described in Appendix A, there are a number of drivers and leverage points for integrating OSH into sustainability. These are potential areas of influence where gaining traction can impact multiple areas of activity in the sustainability movement.

Demand

- Demand is a key driver of the sustainability system. The environmental sector has linked to sustainability through demand and has communicated how going beyond compliance is a smart business decision. Identifying where and how OSH expertise and awareness can be used to drive consumer (e.g., investors, NGOs, public) and supply chain (e.g., business to business interactions) demand may drive conversation and action that can better protect workers.

Costs

- Costs and benefits associated with OSH are not well established and may be externalized. Better demonstrations of the costs associated with failing to fully integrate OSH in the business model (e.g., business case) are critical for driving behavior change and highlighting opportunities for innovation.

OSH Perception

- OSH is perceived as: (1) only a responsibility of OSHA or designated OSH professionals; (2) compliance focused; (3) costly; and (4) a sustainability problem in global supply chains, but not necessarily in the U.S. Until these perceptions change, it will be difficult to elevate safety and health into sustainability discussions. This is an area where there are at least two leverage points: (1) the OSH community—helping safety and health professionals see their role and understand the impact they have on their organization's sustainability efforts and strategies and (2) sustainability-focused organizations and advocates—ensuring that others working in sustainability efforts understand that OSH is an important factor and should be integrated into their work.

Compliance

- Moving beyond a compliance mentality is necessary to achieve sustainability. To leverage action, there must be a compelling case that doing more than is required makes sense for business.

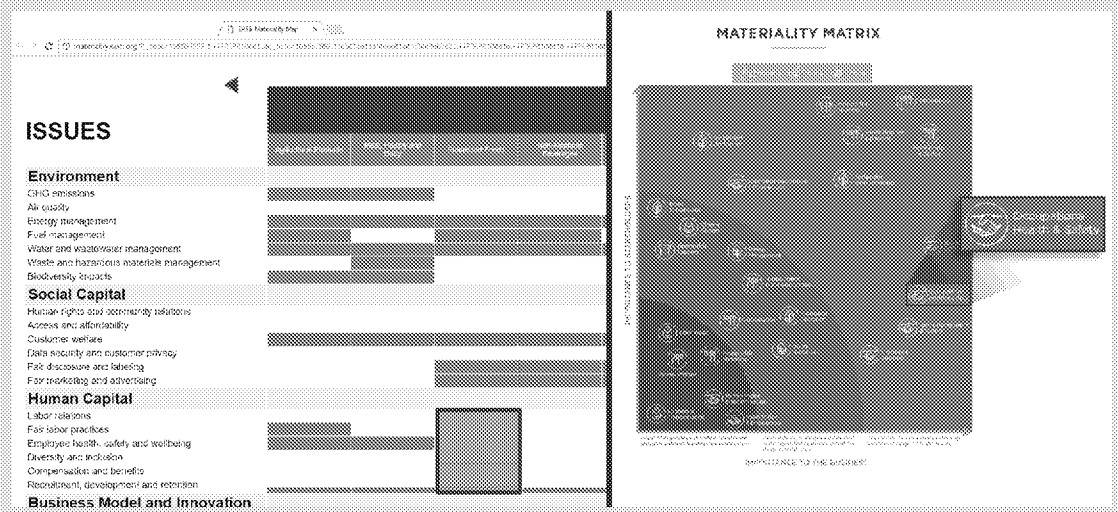
Materiality

- Materiality, the identification of factors that have an impact on business performance, is the basis for sustainability metrics, standards, and reporting. Where a factor is not considered to be material, it is not measured, included, or reported on. Data demonstrating the materiality of OSH is available in only a limited number of sectors. Leveraging the use of OSH data to support findings of materiality can elevate the importance of safety and health within sustainability discussions.

Defining Materiality

There are many different perspectives on what is "material" for an organization. A financially-driven understanding of materiality, which is used by SASB and others in the investing sphere, highlights only those issues where there is clear evidence of financial impact. For large, global companies, many issues, even those that the company itself or its stakeholders might find to be material, would not meet this definition. Impacts would have to be tremendous to amount to evidence of financial impact in this situation.

The difference between a financially-driven understanding of materiality and the stakeholder-driven materiality assessments currently conducted by many organizations is illustrated by the disparate results between the material issues identified by SASB for the processed foods sector and those identified by the Campbell Soup Company's own materiality assessment—occupational health and safety, as well as other human capital issues, were identified by Campbell's as key material issues, while SASB did not identify any topics related to human capital as material.



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POTENTIAL ACTIONS

After considering the trends, opportunities, challenges, and drivers identified through this project, there are a number of pathways for utilizing sustainability to advance worker safety and health. There are multiple potential actions within each pathway that can spur progress toward the full integration and articulation of OSH within sustainability. These actions can be taken not only by OSHA, but also by other individuals and organizations engaged in OSH or sustainability efforts.

Business Case for Sustainability

- **Research scoping and implementation**
  Identify less well-developed topics, such as the burden of poor OSH performance and the benefit of innovation and performance beyond compliance, to support a business case for safety and health. Based on the outcomes of these scoping activities, take action in the areas with the greatest potential impact. This could include evaluating effectiveness of standards, understanding the influence of business structures and models on safety and health outcomes, and gathering business lessons learned and best practices.

- **Testing in the field**
  Move beyond cases studies that are theoretical, anecdotal, or limited to individual organizations into practical applications where effectiveness can be assessed and documented.

- **Influencing metrics and standards**
  Examine whether the metrics and standards being used as the basis for reporting, procurement, investment decision-making, and the evaluation of performance and improvement, include worker safety and health measures, how they have evolved over time, consistency of their use, and their rigor and representativeness. Where gaps exist, identify and validate reliable indicators of OSH attributes and promote their widespread use.

Data Systems

- **Building data streams and systems**
  Understand what data on safety and health exist, where these data come from, and how they can be connected and distributed to enhance decision-making. Identify what data need to be developed to better link OSH to sustainability.

- **Improving data accessibility**
  Make worker health and safety data transparent, readily available for use, and easy to integrate into decision-making.

- **Creating connections between data systems**
  Orient data systems toward supporting materiality determinations and incentivizing employers to have strong human capital performance. The systems should allow for comprehensive data searches, such as linking company profiles to lagging and leading safety and health performance indicators (e.g., injury and illness rates, membership in recognition programs).

Stakeholder Engagement

- **Creating a dialogue around OSH and sustainability**
  Engage individuals representing the OSH community as well as multiple disciplines of sustainability to discuss next steps for integrating OSH into sustainability, horizon scanning, networking, and providing technical expertise.

- **Collaborating to advance OSH and sustainability activity**
  Collaborate with diverse stakeholders interested in addressing similar challenges or opportunities to share resources and expertise. Collaborative efforts around OSH and sustainability could include: data and information gathering and product development for specific audiences, such as industry sectors, small businesses, purchasers, or the investment community; solutions-oriented forums for companies to engage with each other; and mentoring programs for the development of leadership or technical skills.

- **Recognizing leaders**
  Highlight leaders that are successfully incorporating worker safety and health into their sustainability efforts. This aligns with the high value stakeholders place in this type of recognition for their efforts and innovations, as well as existing recognition programs that are already linked to sustainability. Recognizing these leaders also helps to share and promote their excellent practices.

- **Leveraging powerful global efforts**
  Expand engagement to include meaningful relationships with stakeholders that are global in scope and considered best in class in their areas of activity to drive demand throughout the supply chain.

- **Operationalizing for replication and scalability**
  Engage SMEs to advance the development and implementation of innovative safety and health practices. Opportunities exist to tailor tools, standards, certifications, and resources for organizations of all sizes.

Strategies for Success

Ensure that any activities undertaken to advance worker safety and health in sustainability are as inclusive, meaningful, and productive as possible by:

- **Thinking more broadly**—A narrow focus can limit the potential for making broad impacts. It is important to recognize that there may be multiple pathways to gain traction and drive change.
- **Innovating and disrupting**—Business as usual won't allow for transformation. It is critical to explore new and different approaches, as well as adapt existing processes and procedures to allow for growth.
- **Contextualizing**—Know what is going on and who the key players are in order to align with current activities, build credibility, reach the appropriate audience, use the most effective mechanisms of engagement, and identify new opportunities to push forward.
- **Collaborating**—Establish mechanisms for communicating in order to build trust, facilitate dialogue and information exchange, and give credit and value expert input where it is due.

Education

- **Exploring professional development opportunities**
  Identify professionals that would benefit from a greater understanding of the impact that OSH has on business, how to reach them, what materials would be useful, and what messages would resonate. Develop resources and identify venues for meeting these training needs.

- **Creating multi-dimensional next generation professionals**
  Cultivate educational opportunities that integrate worker safety and health into a broad range of academic disciplines, such as public health, business, sustainability, and others. These opportunities can include cross-disciplinary training, coursework, internships, research, degree program requirements, and degrees (e.g., finance and industrial hygiene; environmental and OSH management).

Communications

- **Generating mass appeal**
  Mainstream worker health and safety concerns by sharing compelling stories and informative sound bites through social media, news feeds, blogs, and ad campaigns. Build on these messages to spur action by the public.

MOVING FORWARD

Sustainability is a powerful social movement. Over time, it has gained political will, economic force, and public recognition. OSHA and others have the opportunity to **leverage** this power; to take advantage of the **momentum** that has already been generated; to **transform** the way that worker safety and health is viewed and understood; and ultimately, to **advance sustainability in the workplace**.

Engage with us @OSHA_DOL or sustainability@dol.gov

APPENDIX A. METHODOLOGY

In February 2016, OSHA began formal efforts to explore opportunities to leverage the growing sustainability movement to advance the protection of workers. Following a short period of research, OSHA began to reach out to existing partners and stakeholders to hold conversations regarding their expertise, involvement, and knowledge concerning sustainability within and outside their organizations. A framework (see box) was developed to assist in guiding conversations to learn about the current status of sustainability awareness and activities, discover challenges and/or opportunities for the inclusion of occupational safety and health, and identify additional resources to direct the project's progress. Using these conversations and continued research as a base, additional stakeholders were identified using a snowballing methodology. Approximately 80 conversations were held with stakeholders engaged in a variety of areas of activity related to the sustainability movement with most conversations taking place between March and June, 2016. Although many stakeholders were involved in this initial effort, additional conversations could provide more robust information and context about the identified areas of sustainability activity.

From the notes taken during this period of exploration, efforts were undertaken to detect commonalities and differences in identified sustainability topics, recognize gaps and areas where additional research was needed, and make connections to OSHA's work.

Interview Question Framework

Status

- What is your role in your organization?
- Where are you currently working in the sustainability space? What about occupational health and safety?
- Do you have any efforts to link sustainability and occupational health and safety? If yes, how did you come to this connection?
- What have you tried? How was it received?
- What challenges have you faced?

Communications

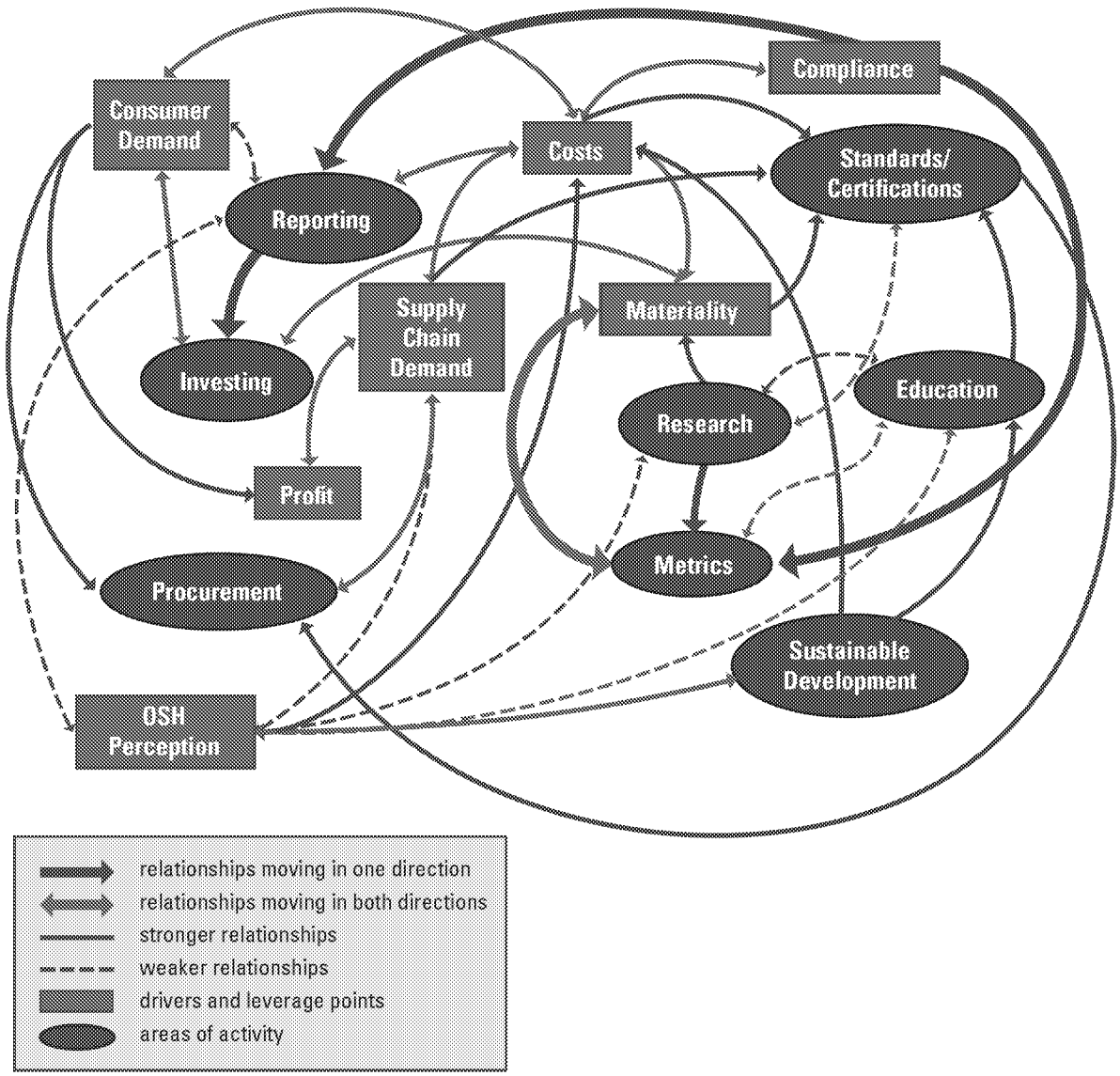
- Who is your audience? Who do you target? Do you intend to broaden?
- Who do you talk to? Occupational health and safety? Sustainability? Corporate responsibility? Other?
- Do you have feedback mechanisms in place?

Moving Forward

- What do you need to keep moving forward? Are there gaps? Opportunities?
- What role do you think OSHA can play?
- Who else do you think we should be speaking with?

Mental Model

As this research effort began, an attempt to visualize the landscape of activity around sustainability was made. The original model was updated as research and conversations developed. This graphic represents a moment in time and highlights potential linkages between topics and actors, mechanisms for activity, and leverage points for the inclusion of OSH. It served as a model to guide research and potential engagement. As the sustainability movement continues to advance and unfold, the landscape of sustainability will also continue to shift and evolve. This systemic view can facilitate the identification of engagement efforts to maximize impact.



Mental Model of Sustainability Landscape

APPENDIX B.
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End Notes

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Message

From: Richard E. Engler, Ph.D. [rengler@lawbc.com]
Sent: 6/1/2018 1:27:50 PM
To: Baptist, Erik [Baptist.Erik@epa.gov]
CC: lbergeson@lawbc.com
Subject: Links
Attachments: p-18-0044-0045_determination_non-cbi_final.pdf; co_all_purpose_preamble_and_consent_order_combined_9-1-2016_clean.pdf; p-14-0314_determination_non-cbi_final(1).pdf

Erik:

We very much appreciate you spending time with us discussing some of the interesting legal interpretations related to new TSCA.

The not-likely determination we discussed is attached (downloaded from https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/tsca-section-5a3c-determination-88); the associated FR notices is at https://www.federalregister.gov/documents/2018/05/17/2018-10579/certain-new-chemicals-or-significant-new-uses-statements-of-findings-for-february-and-march-2018. The FR notice links back to the determination document on EPA's website.

EPA has made one other "not likely" determination for a substance that EPA identified with a hazard other than low hazard for health and low hazard for ecotoxicity ("low/low"). That case is P-14-0314. That determination document is also attached (downloaded from https://www.epa.gov/sites/production/files/2017-08/documents/p-17-0266_determination_non-cbi_final.pdf).

The boilerplate language for 5e consent orders is also attached (downloaded from https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/new-chemicals-program-boilerplates).

We look forward to continuing our discussion.

Rich

–

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF POLLUTION PREVENTION AND TOXICS

REGULATION OF A NEW CHEMICAL SUBSTANCE

PENDING DEVELOPMENT OF INFORMATION

In the matter of:	)	Premanufacture Notice Number:
	)	
	)	
	)	
	)	
	)	
_____	)	_____
	)	
	)	
	)	
	)	
	)	

Consent Order and Determinations Supporting Consent Order

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PREAMBLE

I. INTRODUCTION

Under the authority of § 5(e) of the Toxic Substances Control Act ("TSCA") (15 U.S.C. 2604(e)), the Environmental Protection Agency ("EPA" or "the Agency") issues the attached Order, regarding premanufacture notice ("PMN") P-_____ for the chemical substance _____ ("the PMN substance") submitted by _____ ("the Company"), to take effect upon expiration of the PMN review period. The Company submitted the PMN to EPA pursuant to § 5(a)(1)(B) of TSCA and 40 CFR part 720.

Under § 15 of TSCA, it is unlawful for any person to fail or refuse to comply with any provision of TSCA, any order issued under TSCA, or any consent order entered into under TSCA. Violators may be subject to various penalties and to both criminal and civil liability pursuant to § 16, and to specific enforcement and seizure pursuant to § 17. In addition, chemical substances subject to an order issued under § 5 of TSCA, such as this one, are subject to the § 12(b) export notice requirement.

II. SUMMARY OF TERMS OF THE ORDER

This Consent Order requires the Company to:

(a) submit to EPA certain toxicity testing before manufacturing (including import) a total of _____kilograms of the PMN substance;

(b) provide personal protective equipment to its workers to prevent dermal exposure;

(c) provide respirators to its workers to prevent inhalation exposure;

(d) as an alternative to using respirators, maintain workplace airborne concentrations of the PMN substance at or below a specified New Chemical Exposure Limit ("NCEL") of _____, verified by actual exposure monitoring data (to pursue this option, a sampling and analytical method must be developed by the Company, verified by an independent third-party laboratory, and submitted to EPA);

(e) label containers of the PMN substance and provide Safety Data Sheets ("SDSs") or Material Safety Data Sheets ("MSDSs") and worker training in accordance with the provisions of the Hazard Communication Program section;

(f) not manufacture the PMN substance _____;

(g) not process the PMN substance _____;

(h) not use the PMN substance _____;

(i) distribute the PMN substance only to a person who agrees to follow the same restrictions (except the testing requirements) and to not further distribute the PMN substance until it has been completely reacted;

Commented [DIRECTION1]: This term/physical state needs to match the text in the Exemptions and the Distribution sections of Consent Order

(j) distribute the PMN substance only _____;

(k) dispose of the PMN substance only by _____;

(l) comply with the Release to Water provisions; and,

(m) maintain certain records.

III. CONTENTS OF PMN

By signing this Order, the Company represents that it has carefully reviewed this document and agrees that all information herein that is claimed as confidential by the Company is correctly identified within brackets, that any information that is not bracketed is not claimed as confidential, and that the Company has previously submitted any information so marked to EPA under a claim of confidentiality in accordance with the requirements of TSCA and applicable regulations. To make this document available for public viewing, EPA will remove only the information contained within the brackets.

Confidential Business Information Claims (Bracketed in the Preamble and Order):

Chemical Identity:

Specific:

Generic:

Use:

Specific:

Generic:

Maximum 12-Month Production Volume:

Test Data Submitted with PMN:

IV. EPA'S ASSESSMENT OF EXPOSURE AND RISK

The following is EPA's assessment regarding the probable human and environmental toxicity, human exposure and environmental release of the PMN substance, based on the information currently available to the Agency.

Persistent, Bioaccumulative, and Toxic Concern:

EPA identified human health and environmental concerns because the PMN substance may be a persistent, bioaccumulative, and toxic (PBT) chemical, based on physical/chemical properties of

the PMN substances, as described in the New Chemicals Program's PBT category (64 FR 60194, November 4, 1999)(FRL-6097-7). EPA estimates that the PMN substances will persist in the environment for more than two months and estimates a bioaccumulation factor of greater than or equal to 1,000.

Commented [DIRECTION2]: Include this paragraph only if your chemical is PBT.

Human Health Effects Summary:

Absorption:

Toxicological Endpoints of Concern:

Basis:

[Note to Program Managers: If concern for the PMN substance is based on a chemical category of concern, include the following reference to the New Chemicals Chemical Category Website.]

See https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/chemical-categories-used-review-new

Environmental Effects Summary:

[Note to Program Managers: If concern for the PMN substance is based on a chemical category of concern, include the following reference to the New Chemicals Chemical Category Website.]

See https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/chemical-categories-used-review-new

Exposure and Environmental Release Summary:

Commented [Direction3]: Edit this table as appropriate to your case.

	Manufacture	Process	Use	Consumer
# Sites				
Workers (#/site)				
Exposure (days/year)				
Dermal Exposure (mg/day)				
Inhalation Exposure (mg/day)				
Drinking Water Exposure (mg/day)				
Releases (days/year)				
Release to Water (kg/day)				
Surface Water Concentration (ppb)				
Days Exceeding Concern Level				

Risk to Workers:

[Note to Program Managers: Give statement on MOE or cancer risk.]

Risk to General Public:

Risk to Consumers:

V. EPA'S DETERMINATION

The following findings constitute the basis of this Consent Order, issued under § 5(e) of TSCA:

(a) EPA has determined, pursuant to §§ 5(a)(3)(B)(i) and 5(e)(1)(A)(i) of TSCA, that the information available to the Agency is insufficient to permit a reasoned evaluation of the human health and environmental effects of the PMN substance. This is because

_____

_____.

(a) EPA is unable to determine the potential for_____

_____

from exposure of humans and aquatic organisms to the PMN substance. Therefore, pursuant to §§ 5(a)(3)(B)(ii)(I) and 5(e)(1)(A)(ii)(I) of TSCA, in the absence of sufficient information to permit EPA to make such a determination and in light of the potential risk of_____ posed by the uncontrolled manufacture (which includes import), processing, distribution in commerce, use, and disposal of the PMN substance, EPA has determined that uncontrolled manufacture, processing, distribution in commerce, use, and disposal of the PMN substance may present an unreasonable risk of injury to human health and the environment and that the limitations imposed by this order are necessary to protect against an unreasonable risk.

Commented [DIRECTION4]: Example of edits for a risk and exposure based eco order:

(a) EPA is unable to determine the potential for _____ _____ _____ from environmental release of the PMN substance. Therefore, pursuant to § 5(a)(3)(B)(ii)(I) of TSCA, in the absence of sufficient information to permit EPA to make such a determination and in light of the potential risk of _____ posed by the uncontrolled manufacture, processing, distribution in commerce, use, and disposal of the PMN substance, EPA has concluded that uncontrolled manufacture, processing, distribution in commerce, use, and disposal of the PMN substance may present an unreasonable risk of injury to the environment.

(b) In light of the estimated production volume and environmental release of the PMN substance, EPA has further concluded, pursuant to § 5(a)(3)(B)(ii)(II) of TSCA, that the PMN substance will be produced in substantial quantities and may reasonably be anticipated to enter the environment in substantial quantities.

Commented [DIRECTION5]: For orders that are based solely on lack of information, use this paragraph in place of subparagraphs (a) and (b). OTHERWISE—DELETE.

An example of a reason why we have insufficient information is that we were unable to identify an analog for the PMN substance.

(b) In light of the estimated production volume of, and human exposure to the PMN substance, EPA has determined, pursuant to §§ 5(a)(3)(B)(ii)(II) and 5(e)(1)(A)(ii)(II) of TSCA, that the PMN substance is or will be produced in substantial quantities and that the PMN substance either enters or may reasonably be anticipated to enter the environment in substantial quantities, or there is or may be significant (or substantial) human exposure to the substance.

Commented [DIRECTION6]: For orders that are wholly or partly exposure-based. Edit as appropriate, to reflect the specific exposure-based findings.

VI. INFORMATION REQUIRED TO EVALUATE HUMAN HEALTH AND ENVIRONMENTAL EFFECTS

Triggered Testing. The Order prohibits the Company from exceeding a specified production limit unless the Company submits the information described in the Testing section of this Order in accordance with the conditions specified in the Testing section.

Commented [g7]: DIRECTION: If the order does not contain triggered testing, then delete this section.

Pended Testing. The following additional information would be required to evaluate the following effects which may be caused by the PMN substance:

Information	Effects	Guidelines

The Order does not require submission of the above pended testing at any specified time or production volume. However, the Order's restrictions on manufacture, processing, distribution in commerce, use, and disposal of the PMN substance will remain in effect until the Order is modified or revoked by EPA based on submission of that or other relevant information.

Commented [DIRECTION8]: Delete elements that don't apply in your order, or are not dependant on testing.

CONSENT ORDER

I. SCOPE OF APPLICABILITY AND EXEMPTIONS

(a) Scope. The requirements of this Order apply to all commercial manufacturing, processing, distribution in commerce, use and disposal of the chemical substance _____ (P-__-____)("the PMN substance") in the United States by _____ ("the Company"), except to the extent that those activities are exempted by paragraph (b).

(b) Exemptions. Manufacturing, processing, distribution in commerce, use and disposal of the PMN substance is exempt from the requirements of this Order (except the requirements in the Recordkeeping and Successor Liability Upon Transfer Of Consent Order sections) only to the extent that (1) these activities are conducted in full compliance with all applicable requirements of the following exemptions, and (2) such compliance is documented by appropriate recordkeeping as required in the Recordkeeping section of this Order.

(1) Export. Until the Company begins commercial manufacture of the PMN substance for use in the United States, the requirements of this Order do not apply to manufacture, processing or distribution in commerce of the PMN substance solely for export in accordance with TSCA §§12(a) and 12(b), 40 CFR 720.3(s) and 40 CFR part 707. However, once the Company begins to manufacture, process, or distribute in commerce the PMN substance for use in the United States, no further activity by the Company involving the PMN substance is exempt as "solely for export" even if some amount of the PMN substance is later exported. At that point, the requirements of

this Order apply to all activities associated with the PMN substance while in the territory of the United States. Prior to leaving U.S. territory, even those quantities or batches of the PMN substance that are destined for export are subject to terms of the Order, and count towards any production limit test triggers in the Testing section of this Order.

(2) Research & Development ("R&D"). The requirements of this Order do not apply to manufacturing, processing, distribution in commerce, use and disposal of the PMN substance in small quantities solely for research and development in accordance with TSCA §5(h)(3), 40 CFR 720.3(cc), and 40 CFR 720.36. The requirements of this Order also do not apply to manufacturing, processing, distribution in commerce, use and disposal of the PMN substance when manufactured solely for non-commercial research and development per TSCA §5(i) and 40 CFR 720.30(i).

(3) Byproducts. The requirements of this Order do not apply to the PMN substance when it is produced, without separate commercial intent, only as a "byproduct" as defined at 40 CFR 720.3(d) and in compliance with 40 CFR 720.30(g).

(4) No Separate Commercial Purpose. The requirements of this Order do not apply to the PMN substance when it is manufactured, pursuant to any of the exemptions in 40 CFR 720.30(h), with no commercial purpose separate from the substance, mixture, or article of which it is a part.

(5) Imported Articles. The requirements of this Order do not apply to the PMN substance when it is imported as part of an "article" as defined at 40 CFR 720.3(c) and in compliance with 40 CFR 720.22(b)(1).

(6) Completely Reacted (Cured). The requirements of this Order do not apply to quantities of the PMN substance after they have been completely reacted (cured) or _____. **[Note to Program Managers: If applicable to the specific PMN substance, identify a state or states in which exposure to the PMN substance no longer presents a significant risk, e.g.,**

"incorporated into a polymer matrix", "adhered onto film", or similar. Delete this exemption if there is no such state, or if the substance cannot be completely reacted/cured.]

Commented [DIRECTION9]: Not necessary to include this exemption in any exposure-based order.

(c) Automatic Sunset. If the Company has obtained for the PMN substance a Test Market Exemption ("TME") under TSCA §5(h)(1) and 40 CFR 720.38 or a Low Volume Exemption ("LVE") or Low Release and Exposure Exemption ("LoREX") under TSCA §5(h)(4) and 40 CFR 723.50(c)(1) and (2) respectively, any such exemption is automatically rendered null and void as of the effective date of this Consent Order.

II. TERMS OF MANUFACTURE, PROCESSING, DISTRIBUTION IN COMMERCE, USE, AND DISPOSAL PENDING SUBMISSION AND EVALUATION OF INFORMATION

PROHIBITION

The Company is prohibited from manufacturing (which under TSCA includes importing), processing, distributing in commerce, using, or disposing of the PMN substance in the United States, for any nonexempt commercial purpose, pending the development of information necessary for a reasoned evaluation of the human health and environmental effects **[Note to Program Managers: Edit as appropriate.]** of the substance, and the completion of EPA's review of, and regulatory action based on, that information, except in accordance with the conditions described in this Order.

TESTING

Commented [DIRECTION10]: Include paragraphs (a), (b), (c), and (j) in all orders. Include the entire testing section in any order with triggered testing.

(a) Section 8(e) Reporting. Reports of information on the PMN substance which reasonably supports the conclusion that the PMN substance presents a substantial risk of injury to health or the environment and which is required to be reported under TSCA section 8(e) must reference the appropriate PMN identification number for this substance and contain a statement that the substance is subject to this Consent Order. Additional information regarding section 8(e) reporting requirements can be found at *www.epa.gov/oppt/tsca8e*.

(b) Notice of Study Scheduling. The Company must notify, in writing, the EPA Monitoring Assistance and Media Programs Division, Office of Enforcement and Compliance Assurance (OECA) , U.S. Environmental Protection Agency, of the following information within 10 days of scheduling any study required to be performed pursuant to this Order, or within 15 days after the effective date of this Order, whichever is later:

(1) The date when the study is scheduled to commence;

(2) The name and address of the laboratory which will conduct the study;

(3) The name and telephone number of a person at the Company or the laboratory whom EPA may contact regarding the study; and,

(4) The appropriate PMN identification number for each substance and a statement that the substance is subject to this Consent Order.

The written notice should be submitted to EPA/OECA as follows:

Postal Mail Address

U.S. Environmental Protection Agency

GLP Section Chief – Pesticides, Water and Toxics Branch

Monitoring Assistance and Media Programs Division (2227A)

Office of Enforcement and Compliance Assurance

1200 Pennsylvania Avenue, N.W.

Washington, DC 20460

Courier Delivery Address

U.S. Environmental Protection Agency

GLP Section Chief – Pesticides, Water and Toxics Branch

Monitoring Assistance and Media Programs Division (2227A)

Office of Enforcement and Compliance Assurance

Room 7117B

1200 Pennsylvania Avenue, N.W.

Washington, DC 20004

A copy of the letter submitted to EPA/OECA must also be submitted concurrently as a support document for the PMN, using the procedures set out in 40 CFR 720.40.

(c) Good Laboratory Practice Standards and Test Protocols. Each study performed to address the risks identified in this Order must be conducted according to TSCA Good Laboratory Practice Standards at 40 CFR Part 792 and using methodologies generally accepted in the relevant scientific community at the time the study is initiated. Before starting to conduct any study that will use a modified version of a published test guideline, the Company must submit written test protocols to EPA for review (submission of written test protocols is optional for tests that are to be conducted using unmodified published test guidelines). Protocols must be submitted as a support document for the PMN, using the procedures set out in 40 CFR 720.40 [if for order is for SNUN,

Commented [DIRECTION11]: If your order uses an unmodified test guideline and will nonetheless require EPA review, edit as appropriate.

Also, make sure that paragraph (d) clearly indicates whether the test guideline is modified.

add "and 721.25"]. EPA will respond to the Company within 4 weeks of receiving the written protocols. EPA review of a test protocol does not mean pre-acceptance of test results.

(d) Triggered Testing Requirements. The Company is prohibited from manufacturing (which includes importing) the PMN substance [edit as appropriate: after a certain date and/or aggregate domestic manufacture and import volume] ("the production limit"), unless the Company conducts the following studies on the PMN substance and submits all final reports and underlying data in accordance with the conditions specified in this Testing section.

Production Limit	Study	Test Guideline

Until the Company submits all final reports and underlying data, the Company must submit to EPA a letter reporting the cumulative manufacture (which includes import) volume of the PMN substance every six months following commencement of manufacture. This letter must be submitted as a support document for the PMN, using the procedures set out in 40 CFR 720.40.

Commented [g12]: [DIRECTION XX]: This paragraph shall be used whenever a testing trigger is production volume based and which is not expected to be met for at least 1.5 years.

(e) Test Reports. The Company must: (1) conduct each study in good faith, with due care, and in a scientifically valid manner; (2) promptly furnish to EPA the results of any interim phase of each study, if requested by EPA; and (3) submit the final report of each study (with an additional sanitized copy, if confidential business information is involved) and all underlying data ("the report and data") to EPA prior to exceeding the applicable production limit. The final report and data must be submitted as a support document for the PMN, using the procedures set out in 40 CFR 720.40 [if for order is for SNUN, add "and 721.25"]. The final report must contain the contents specified in 40 CFR 792.185. Underlying data must be submitted to EPA in accordance

Commented [CFW13]: [DIRECTION XX]: Up to this point, the entire order has been written for a PMN and does not discuss SNUNs. If you want to use this boilerplate for a SNUN, further language regarding the SNUR and SNUN is necessary.

with the applicable "Reporting," "Data and Reporting," and "Test Report" subparagraphs in the applicable test guidelines. However, for purposes of this Consent Order, the word "should" in those subparagraphs will be interpreted to mean "must" to make clear that performing the applicable procedures and submitting the applicable information are mandatory. EPA will require the submission of raw data such as slides and laboratory notebooks only if EPA finds, on the basis of professional judgment, that an adequate evaluation of the study cannot take place in the absence of these items.

(f) Testing Waivers. The Company is not required to conduct a study specified in paragraph (d) of this Testing section if notified in writing by EPA that it is unnecessary to conduct that study.

(g) Equivocal Data. If EPA finds that the data generated by a study are scientifically equivocal, the Company may continue to manufacture the PMN substance beyond the applicable production limit. To seek relief from any other restrictions of this Order, the Company may make a second attempt to obtain unequivocal data by reconducting the study under the conditions specified in paragraphs (b), (c), and (e) (except that the study may be submitted after reaching the applicable production limit). The testing requirements may be modified, as necessary to permit a reasoned evaluation of the risks presented by the PMN substance, only by mutual consent of EPA and the Company.

(h) EPA Determination of Invalid Data.

(1) Except as described in subparagraph (h)(2), if, within 6 weeks of EPA's receipt of a test report and data, the Company receives written notice that EPA finds that the data generated by

a study are scientifically invalid, the Company is prohibited from further manufacture of the PMN substance beyond the applicable production limit.

(2) The Company may continue to manufacture the PMN substance beyond the applicable production limit only if so notified, in writing, by EPA in response to the Company's compliance with either of the following subparagraphs (h)(2)(i) or (h)(2)(ii).

(i) If there is sufficient time to reconduct the study in compliance with paragraphs (b), (c), and (e) before exceeding the production limit specified in paragraph (d), the Company may reconduct the study. If there is insufficient time to reconduct the study in compliance with paragraphs (b), (c), and (e) before exceeding the production limit specified in paragraph (d), the Company may exceed the production limit, but must otherwise comply with paragraphs (b), (c), and (e), and must submit the report and data to EPA within a reasonable period of time, all as specified by EPA in the notice described in subparagraph (h)(1). EPA will respond to the Company, in writing, within 6 weeks of receiving the Company's report and data.

(ii) The Company may, within 4 weeks of receiving from EPA the notice described in subparagraph (h)(1), submit to EPA a written report refuting EPA's finding. EPA will respond to the Company, in writing, within 4 weeks of receiving the Company's report.

(i) Company Determination of Invalid Data.

(1) Except as described in subparagraph (i)(2), if the Company becomes aware that circumstances clearly beyond the control of the Company or laboratory will prevent, or have prevented, development of scientifically valid data under the conditions specified in paragraphs (c) and (e), the Company remains prohibited from further manufacture of the PMN substance beyond the applicable production limit.

(2) The Company may submit to EPA, within 2 weeks of first becoming aware of such circumstances, a written statement explaining why circumstances clearly beyond the control of the Company or laboratory will cause or have caused development of scientifically invalid data. EPA will notify the Company of its response, in writing, within 4 weeks of receiving the Company's report. EPA's written response may either:

(i) allow the Company to continue to manufacture the PMN substance beyond the applicable production limit, or

(ii) require the Company to continue to conduct, or to reconduct, the study in compliance with paragraphs (b), (c), and (e), if there is sufficient time to conduct or reconduct the study and submit the report and data to EPA before exceeding the production limit specified in paragraph (d). If there is insufficient time for the Company to comply with paragraphs (b), (c), and (e) before exceeding the production limit specified in paragraph (d), the Company may exceed the production limit, but must otherwise comply with paragraphs (b), (c), and (e), and must submit the report and data to EPA within a reasonable period of time, all as specified by EPA in the notice described in subparagraph (i)(2). EPA will respond to the Company, in writing, within 6 weeks of receiving the Company's report and data, as to whether the Company may continue to manufacture beyond the applicable production limit.

(j) Unreasonable Risk.

EPA may notify the Company in writing that EPA finds that the data generated by a study (including studies not performed or information not generated under this Consent Order) are scientifically valid and unequivocal and indicate that, despite the terms of this Order, the PMN substance will or may present an unreasonable risk of injury to human health or the environment.

EPA's notice may specify that the Company undertake certain actions concerning further testing, manufacture, processing, distribution, use and/or disposal of the PMN substance to mitigate exposures to or to better characterize the risks presented by the PMN substance. Within 2 weeks from receipt of such a notice, the Company must cease all manufacture, processing, distribution, use and disposal of the PMN substance, unless either:

(1) within 2 weeks from receipt of the EPA notice, the Company complies with such requirements as the notice specifies; or

(2) within 4 weeks from receipt of the EPA notice, the Company submits to EPA a written report refuting EPA's finding and/or the appropriateness of any additional requirements imposed by EPA. The Company may continue to manufacture, process, distribute, use and dispose of the PMN substance in accordance with the terms of this Order pending EPA's response to the Company's written report. EPA will respond to the Company, in writing, within 4 weeks of receiving the Company's report. Within 2 weeks of receipt of EPA's written response, the Company must comply with any requirements imposed by EPA's response or cease all manufacture, processing, distribution, use and disposal of the PMN substance.

(k) Other Requirements. Regardless of the satisfaction of any other conditions in this Testing section, the Company must continue to obey all the terms of this Consent Order until otherwise notified in writing by EPA. The Company may, based upon submitted test data or other relevant information, petition EPA to modify or revoke provisions of this Consent Order pursuant to Part VI. of this Consent Order.

PROTECTION IN THE WORKPLACE

Commented [DIRECTION14]: For risk-based orders. Edit to include the provisions relevant to your substance. Cross references are flagged in this paragraph. If any paragraphs are removed, you will need to check that the cross references are all still correct.

BE SURE TO DELETE THE APPENDIX WITH THE RESPIRATOR TABLES.

(a) Establishment of Program. During manufacturing, processing, and use of the PMN substance at any site controlled by the Company (including any associated packaging and storage and during any cleaning or maintenance of equipment associated with the PMN substance), the Company must establish a program whereby:

(1) General Dermal Protection. Each person who is reasonably likely to be dermally exposed in the work area to the PMN substance through direct handling of the substance or through contact with equipment on which the substance may exist, or because the substance becomes airborne in a form listed in subparagraph (a)(5) of this section, engineering control measures (e.g. enclosure or confinement of the operation, general and local ventilation) or administrative control measures (e.g. workplace policies and procedures) shall be considered and implemented to prevent exposure, where feasible. Where engineering, work practice, and administrative controls are not feasible or dermal exposure is still reasonably likely, each person subject to this exposure is provided with, and is required to wear, personal protective equipment that provides a barrier to prevent dermal exposure to the substance in the specific work area where it is selected for use. Each such item of personal protective equipment must be selected and used in accordance with Occupational Safety and Health Administration ("OSHA") dermal protection requirements at 29 CFR 1910.132, 1910.133, and 1910.138.

Commented [DIRECTION15]: check

[Note to Program Managers: Use Paragraph (a)(2) when the PMN substance may present a high dermal risk and you want to specifically require certain types of dermal protective equipment. If the dermal risk is only moderate or general, paragraph (a)(1) alone may suffice and you can delete (a)(2). But need to relabel in paragraphs (5) and (6) below].

(2) Specific Dermal Protective Equipment. The dermal protective equipment required by subparagraph (a)(1) of this section must include, but is not limited to, the following items:

(i) Gloves.

(ii) Full body chemical protective clothing.

(iii) Chemical goggles or equivalent eye protection.

(iv) Clothing which covers any other exposed areas of the arms, legs and torso.

(3) Demonstration of Imperviousness. The Company is able to demonstrate that each item of chemical protective clothing selected, including gloves, provides an impervious barrier to prevent dermal exposure during normal and expected duration and conditions of exposure within the work area by any one or a combination of the following:

Commented [DIRECTION16]: Include subparagraph (a)(3) in its entirety whenever subparagraphs (a)(1) or (2) are included.

(i) Permeation Testing. Testing the material used to make the chemical protective clothing and the construction of the clothing to establish that the protective clothing will be impervious for the expected duration and conditions of exposure. The testing must subject the chemical protective clothing to the expected conditions of exposure, including the likely combinations of chemical substances to which the clothing may be exposed in the work area. Permeation testing must be conducted according to the American Society for Testing and Materials ("ASTM") F739 "Standard Test Method for Permeation of Liquids and Gases through Protective Clothing Materials under Conditions of Continuous Contact." Results must be reported as the cumulative permeation rate as a function of time, and must be documented in accordance with ASTM F739 using the format specified in ASTM F1194-99(2010) "Standard Guide for Documenting the Results of Chemical Permeation Testing of Materials Used in Protective Clothing Materials." Gloves may not be used for a time period longer than they are actually tested